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[OFFICIAL NOTICE.]

Wrinkle Department, Western Gas Association.

WESTERN GAS ASSOCIATION, OFFICE OF THE SECRETARY,
NEW ALBANY, IND., Jan. 16, 1899.

To the Members of the Western Gas Association:

Mr. E. H. Jenkins, Editor of the Wrinkle Department, desires it known that those who have contributions to offer for publication in this valuable division of the Association's proceedings, should forward the same at as early a date as possible. All matter of this nature should be in hand not later than April 1st. Let no member fail to mail Mr. Jenkins a description of any device that saves labor or insures through its use better service in the production or distribution of gas.

Address all communications to Mr. E. H. Jenkins, Engineer Buffalo City Gas Company, Buffalo, N. Y. J. W. DUNBAR, Secretary.

[Special Editorial Correspondence.]

Fifteenth Annual Meeting, Ohio Gas Light Association.

SPRINGFIELD, O., March 15, 1899.

Dear JOURNAL: The fifteenth annual sessions of the Ohio Gas Light Association were inaugurated this morning rather in sorrow than in joy, for the members at gavel fall were confronted by the stern fact that, in the interim of their last assembling, death had taken from them their President—Mr. B. P. Holmes, of Youngstown. But the reins of direction had not fallen to the ground, for Vice-President Jenkins and Secretary Jones were in the traces, working well together in the face of the Association's common misfortune. It would be untruthful to say that the cloud cast by the President's death did not dull the proceedings of the day; but it would be equally untruthful to assert that the sessions were not of interest, value and entertainment, as the subsequent report of the meeting will amply attest. The Vice-President (Mr. E. H. Jenkins, Buffalo, N. Y.), called the meeting to order, in the Council Chamber of Springfield, at the appointed time. In a brief speech he introduced General Asa S. Bushnell, President of the Springfield Gas Company—he is Governor of the State of Ohio as well—who welcomed heartily the Association in the name of the State and on behalf of the Company. The General concluded his address by acting for the Mayor of Springfield—the Hon. John M. Good—who was to have acted for himself, but who was detained, through press of official duties, from acting at the appointed time. The particular action was the presentation to the Association of a huge tin key, which meant that the city and its wealth of pleasures were at the fingers' ends of the Association. Mr. Irvin Butterworth having responded cleverly to the General's hearty invitation and witty remarks, the regular order was taken up. President Jenkins (for such he in effect was), having welcomed the guests present, announced the report of the Executive Committee, after which came the well put together annual statement of Secretary-Treasurer Jones. Roll call was next in order. Then followed the reading of many messages of sympathy from other Associations over the loss sustained by the Ohio body through the death of its President. All of the messages were in truthful key and completely indicative of the fellowship that exists amongst gas men, the lines from the Western Gas Association being especially appropriate and fraternal. The President next read his inaugural address,[1] and for its preparation,

1. See page 411.

at such short notice, and considering the home troubles that have been his for many months, he should be heartily congratulated. It is not a lengthy paper, but his crisp references to many living matters in connection with the trade will not be the less understandable for their brevity—acetylene lighting, municipal control and Welsbach street lighting, for instance. The address having been referred to a committee, the paper list was taken up. Mr. C. W. Andrews (Hamilton, Ohio), read the first number, which was entitled "Some Notes on the Construction of a Concrete Gasholder Tank." It led to a good discussion, during which some comment was made on recent accidents to gasholders. This closed the morning session. The afternoon session was opened by the reading of a supplementary report from the Executive Committee, in which it was declared that General Bushnell should be elected to honorary membership. It is needless to say that the suggestion was indorsed without delay; so the General is once more decorated. May he long live to carry his additional honors. The next thing in order was the paper by Mr. J. A. Mayers, of Columbus, Ohio, on "Distribution Records: Their Uses and Preservation." Mayers is a youngster, but his theme was so well presented that its lines kept the tongues of the older ones going for quite a while. The Beal medalist of the American Gas Light Association (Mr. Henry L. Doherty, of Madison, Wis.), then brought out an excellent "Bunch of Short Topics," the discussion of which was lively and valuable. A desultory attack on the Question Box was ordered, and the technical proceedings of the day were brought to an end in the recital by General-Governor Bushnell of the start, rise and progress of the Springfield Gas Company, which enterprise it might be said is of record since 1849. This evening the members enjoyed a visit to the theater, at the invitation of the Springfield Company, and later on were entertained at an informal supper, spread in the dining room of the Arcade Hotel, the Welsbach Street Lighting Company being the hosts. The toastmaster was Mr. Donald McDonald, of Louisville, Ky., and the director and his subjects seemed to be on pretty good terms with each other. Mayor Good was on hand at the feast, and he made a rousing good speech, too.—C.

SPRINGFIELD, O., March 16, 1899.

Dear JOURNAL: Good weather, excellent attendance and strict attention to business marked the sessions of the last day of the Ohio's meeting. The second roll call determined the presence of 92 members, and the round-up in the instance of new members elected this year shows an addition of 37 names to the list. The first paper taken to day was that by Col. J.W. R. Cline (Gen. Bushnell's right-hand man), who dilated cleverly and convincingly on the merits of "Welsbach Street Lighting." Col. Cline's experience and belief recital led to a good debate. The next paper read was by Mr. E. E. Eysenbach, of Columbus, who presented a careful study of "By-Product Coke Ovens," and was rewarded by a good debate on the main points of his narrative. The Committee to Name Next Place of Meeting suggested Columbus, which suggestion was indorsed. Other reports from various committees, which included a vigorous message from the committee named to investigate the matter of municipal control, a sensible presentation from the Committee on Coal Tar, and a statement of value from the Committee on Statistics, having been disposed of, the contents of the Question Box were finished and the strictly technical part of the programme was at an end. The executive session was dispensed with, and the election for officers resulted in the following selections:

President—A. P. Lathrop, Columbus.
Vice-President—George Whysall, Troy.
Secretary and Treasurer—T. C. Jones, Delaware.
Members of Executive Committee—J. H. Maxon, Gallipolis, and C. W. Andrews, Hamilton.

Hearty votes of thanks were passed to President Jenkins, to Secretary Jones, to the Springfield Gas Company and to the Entertainment Committee, after which the sessions were declared adjourned. The meeting lacked nothing in any essential or detail going to make such an assembling completely up to the purposes for which Gas Associations are maintained.—C.

NOTES.—We regret to state that, in our report of the meeting of the New England Association of Gas Engineers, a misprint occurred in connection with the initials of Mr. Polk, of Providence, R. I., who wrote the valuable paper entitled "A Beginner's Experiments in Studying the Operation of a Lowe Water Gas Apparatus," which was subsequently ordered printed in pamphlet form for distribution to the members. We state the author's name as J. B. Polk, but his rightful name is Roger W. Polk.——The report of the City Gas Inspector, of Louisville, Ky. (Mr. Hoertz), for the month of February, respecting the illuminating value of the gas supplied by the Louisville Company, shows it to have been 2.45 candles above the legal requirement.

[Concluded from Page 377.]

ABSTRACT OF PROCEEDINGS, SIXTH ANNUAL MEETING, MICHIGAN GAS ASSOCIATION.

HELD IN LANSING, MICH., FEB. 22 AND 23, 1899.

SECOND DAY—FEB. 23—MORNING SESSION.

The Association reconvened at 10:20 A. M., Feb. 23d. The Secretary read a letter from Mr. John A. Britton, Secretary of the Pacific Coast Gas Association, regretting that time and distance prevented him from taking part in the Michigan's meeting.

The President introduced Mr. B. O. Tippy, of Grand Rapids, Mich., who read the appended paper on

PITCH IN HYDRAULIC MAINS.

A short time ago I was notified by our Secretary that there would be a dearth of papers at this meeting and was asked to contribute one. This did not give me the time to perform such experimenting as I would desire in the preparation of a paper; but as it seemed doubtful if conditions could anywhere be found offering better opportunities for the study of the cause of the formation of pitch in hydraulic mains than we have had in the Detroit works during the past year, and as our experience in this line has proved an interesting experiment, I concluded to entitle my paper "Pitch in Hydraulic Mains," and under that head state my experience and observations.

I am certain that unless there is a coal on the market possessing more inherent possibilities for the formation of pitch than that we are using, it would be impossible for any one to have more pitch form per square foot of hydraulic main than we experienced for a time. With six benches in operation the continual services of three or four men were required to remove the pitch from the hydraulic mains and take it to the boiler room. This abnormal production was co-incident with an increase in the charge of coal per retort and an increase in the yield of gas per pound of coal carbonized.

Notwithstanding the trouble with the pitch, and that the standpipes were choking as they had never choked before, it was resolved to maintain the higher heats and solve the problem if possible.

The coal gas benches in our works are full-depth regenerator benches, of six through retorts, 21 feet long, having mouthpieces at each end, and two independent hydraulic mains for each bench. The standpipes are 8 inches inside diameter. The hydraulic mains are set 3 feet above brickwork, and there is 2 feet of brickwork between them and under side of arch.

The tar had to be drawn from the bottom of the hydraulic mains through a 3-inch draw-off pipe, by opening a valve and permitting the tar to run into an open trough. Water was run into the top of the main each time the tar was drawn off to seal the dip pipes.

In studying the literature bearing upon this subject I noticed the general opinion seemed to be that the tar in the bottom of the mains was distilled to pitch by the heat radiated from the benches. This certainly could not account for the heavy tar in our hydraulic mains, as the temperature of this heavy tar lying on the bottom of the main was cooler by 15° to 20° than the water above it.

After making sure there was no possible neglect in drawing off the tar at regular intervals, as per instructions, thus maintaining a water seal and not allowing the hot gases to bubble through the tar, I concluded the excessive amount of pitch must be due to the long retorts.

To test this theory the seal of hydraulic at one end of a bench was deepened so no gas could pass through it, in order to see what kind of tar would be obtained at the other hydraulic. The experiment was hardly begun before most of the standpipes were choked with lampblack and the experiment abandoned.

Firebrick walls were next built across the retort, midway between the ends, dividing them into two independent retorts.

As this work, which required some time to complete, progressed on the first bench, it was plain that the experiment was likely to be successful; for as one retort after another of the six was bricked up there was less and less trouble with pitch in these two hydraulic mains, and good tar was continually made with this stack of benches. The retorts in all of our benches were similarly treated and have been in continuous operation for several months. We have maintained our heats and have been practically free from annoyance with choked standpipes and pitch in our hydraulic mains. In order to determine definitely the cause of the pitch found in hydraulic, the following experiments were made in two middle retorts of a bench selected for that purpose:

The center wall of one retort was removed and the standpipe at one end effectually closed, the wall being left in the other; thus we had two

experimental retorts, one 21 feet long, the other 10 feet long. Samples of gas and tar were obtained at the beginning, middle and end of a charge, and, as a matter of interest, the temperatures of gas in the standpipes were taken at a point 8½ feet above the mouthpiece throughout the length of the run, which was of about four hours' duration. The samples of gas were analyzed and the quality of the tar noted. The results were as follows:

Analysis of Samples of Gas Taken from a 21-Foot Retort.

	15 Mins.	1 Hour.	2 Hrs. 15 Mins.	3 Hrs. 35 Mins.
HS	1.50	1.21	0.20	0.00
CO	1.10	1.01	0.61	0.00
O	0.70	0.00	0.00	0.00
Illuminants	3.00	2.02	0.20	0.00
CO	7.30	6.07	3.73	2.80
H	22.06	37.34	62.84	76.96
CH	57.31	47.01	28.86	15.39
N	7.03	4.24	3.56	4.81
	100.00	98.90	100.00	99.96

Analysis of Samples of Gas Taken from a 10-Foot Retort.

	15 Mins.	1 Hr. 45 Mins.	3 Hrs. 35 Mins.
HS	1.84	0.60	0.20
CO	0.82	0.50	0.20
O	0.21	0.10	0.00
Illuminants	4.91	2.21	0.72
CO	5.73	3.72	2.45
H	26.56	48.83	61.64
CH	54.99	39.01	27.09
N	3.05	4.76	5.60
	98.11	99.73	97.90

Temperatures of Gas Taken in Standpipe at a Point 8½ Feet Above the Mouthpiece of Retort.

Length of Retort, 21 Feet. Charge Had Been in	Temp. Degrees F.	Length of Retort, 10 Feet. Charge Had Been in	Temp. Degrees F.
8 mins	735	15 mins	450
13 "	775	25 "	465
16 "	790	35 "	466
18 "	787	40 "	465
23 "	783	45 "	452
30 "	770	1 hour	439
1 hour	722	1½ hours	410
1½ hours	700	2 "	380
2 "	660	2½ "	315
2½ "	600	3 "	244
3 "	505	3½ "	200
3½ "	400	.. "	...

Temperature of liquor in hydraulic main, 160° F.; temperature of thick tar in bottom of main, 140° F.

The quality of the tar obtained appears to have been as follows: With short retort, beginning of run, thin tar; middle of run, medium tar; end of run, heavy tar and pitch. With long retort, beginning of run, medium tar; middle of run, heavy tar and pitch; end of run, lampblack.

The gas from which the samples of tar were obtained was taken from the standpipe, about 2 feet above the mouthpieces. Thus it will be seen that, as the heavy tar and pitch samples were obtained from the gas before it reached the hydraulic main, they must have been produced in the retort.

It is very noticeable in resolving the analysis that the percentages of illuminants and marsh gas found in the samples of gas taken from the short retort are in excess of those from the long retort, while the percentages of hydrogen found in the samples taken from the long retort are in excess of those from the short retort, thus indicating that, in the long retort, the hydrocarbons were largely split up into hydrogen and carbon.

This inference is strongly supported by the lampblack obtained from the long retort, which apparently was the carbon liberated from the hydrocarbons in the form of free carbon.

These experiments seem to prove that, as the gaseous hydrocarbon and hydrocarbon vapors discharged from the long retorts had to travel an extreme distance in contact with the hot coke and sides of retort, the vapors of tar lost more or less of their oils, the amount of this loss being dependent upon the distance they traveled through the hot retort, and the light gaseous hydrocarbons were split up into free hydrogen and carbon in the form of lampblack.

It is possible that when the retorts were used as through retorts the seal might be deeper in one hydraulic than in the other, that one standpipe might have a smaller opening for the gas to pass through, owing to its becoming partly choked, and thus the flow of gas, instead of being divided equally between the two standpipes, would go the way of the least resistance, one of them taking the bulk of the gas.

From the rough experiments above recited, my deduction is that the pitch, in our case at least, was produced in the retort and deposited in the hydraulic main, where it settled by gravity.

A brisk and instructive discussion of the paper was terminated by a vote of thanks to its author, who promised to report some further experiments in similar lines at the next meeting.

The President then asked Mr. Henry W. Douglas, of Ann Arbor, Mich., to read his paper on

THE USE OF GAS FOR PURPOSES OTHER THAN FUEL.

During the past 10 years the Gas Associations have been flooded with papers on "How to increase the use of gas for purposes other than lighting;" "How to sell gas stoves;" "Gas for fuel," etc., etc., but a glance through the lists will show that the illuminating side of the business has been sadly neglected. And it is to bring certain facts and figures before our Association, and to glean from its members their various methods of meeting this problem, that I have hastily gotten together these brief notes.

In the first place, let us consider how our illuminating business has fared during the past 10 years. Take an average increase of 10 per cent. per annum in our total business, and assuming 100 as a base, would make a total of 227 for the present time. Again, assuming that this year 50 per cent. of our business is fuel, which, I think, is a fair assumption, would give the light sales today at 113, or a gain of 13 per cent. in 10 years—a very small showing.

Let us consider the causes of this small increase, or rather, the competition which we have had to meet and how we have met it. First, in regard to commercial lighting. Kerosene; advantage over gas, apparent cost. This, however, is only apparent, and appears so from the fact that it is purchased in small quantities; the prepayment meter will overcome this obstacle. The price of kerosene will undoubtedly increase, so that competition in this line need not be feared. Electricity offers us our most formidable competitor. Advantages; cleanliness, coolness and convenience. Disadvantage; cost only.

To meet competition, we must first improve the convenience of gas up to a point where its lesser cost will overbalance the undeniable advantages of electricity.

In commercial lighting there are two problems to meet: Interior lighting and window lighting. In most cases of interior lighting it is necessary to be confined to an existing line of pipe put in perhaps 30 years ago. Lights should be located where needed, and not where there happens to be a fixture, and should not be too much concentrated. In incandescent lights, always use reflectors rather than globes.

Automatic lighting plans are not as much of a necessity as in window lighting. It is best to use ornamental, but simple, fixtures and chandeliers, with arms of ⅜-inch pipe, if possible. The nature of the store to be lighted must always be considered in determining the number of lights. A room with dark ceiling and walls requires fully a third more light than with lighter tints, and where the stock to be displayed is of dark colors still further increase is necessary.

In window lighting the problem is a much greater one. The piping of an ordinary show window is usually intended for a 2-light fixture, but what showing can we expect to make with these lights against a window filled with electric lights? The secret of successful window lighting is to have the lights concealed. An excellent way to accomplish this is to put incandescent lights with reflectors on a pipe fixture extending entirely across the window, as near the ceiling as can be done with safety. The lights should not be more than 18 inches or 2 feet apart, and the fixture can be entirely covered with brass or nickel casing, or can be bronzed. It is desirable in adjusting and trimming the lights that a separate shut-off should be put in each burner. The window shades should be pulled down just below the lights. The result is that the goods displayed are nicely illuminated, and a glare of light is not thrown in the passer's eyes. The two most serious problems, however, in window lighting are automatic lighting and ventilation. I have yet to find a satisfactory solution to the former. Separate by-pass burners for each light are not feasible, because it is usually difficult to get into the window to turn them on, and the mechanism of strings and chains which would operate them would be cumbersome. A single by-pass which controls all the lights consumes entirely too much gas, and requires a very accurate adjustment of the various lights in order that some of them may not be extinguished.

Electric lighting offers a better solution, but the initial cost of installation is very high, and it is very difficult to keep the batteries in proper condition. If a jump spark system is used, it requires an induction coil with a spark equal to the total spark of all the lamps, and if a battery of six lamps is used a coil giving at least a ¾-inch spark is required. This, in turn, requires a very powerful battery, and the wiring must be very carefully put up so that the greater part of the current is not lost. If the number of lights be broken up so as to light separately, the wiring is quite complicated and unsightly in a window. If a cluster of lights be used, the by-passing can be more easily accomplished, and I have recently been using an electric igniter which gives fairly satisfactory results. The spark is obtained by friction which ignites a small perforated tube extending over the tops of the lamps in the fixture; at the time the spark is formed the gas is turned on to this pipe, and immediately on the lighting of the cluster is shut off again. This causes a flame around the entire lamps and works with very little battery power. However, it is my opinion that clusters of lights are not nearly as satisfactory except in narrow windows; so many of the show windows of the present day being built in the box form with absolutely no ventilation. At first it would seem that it is impossible to use gas; however, if a series of holes be bored at the base of the interior partition, and similar holes be made at the top of the window frame, ventilation will be of much help. Frost can be prevented very largely if a steam pipe can be extended around the window at the base of the glass. This, of course, is not often possible, but excellent results would be obtained if we could convince the owner of the building to put it in.

One of the most serious drawbacks to the extensive use of gas in modern houses is the design of the combination fixture. It is a very rare thing to find a combination fixture which is not built largely in favor of the electric light. Gas burners are always entirely too high, the keys are out of reach, and the light is usually obstructed by the electric globes which are underneath; add to this a heavily frosted shade, and it is no wonder that the electric light is used in preference. Fixtures can, however, be obtained which will give much better results, and a little education of your consumer at the proper time may have considerable effect upon the amount of gas which he uses afterward. It is surprising how many people we find attempting to read with a gas jet fully 8 feet from the floor. Who would think of putting a lamp at that height for such purposes? Here, again, education will do wonders. If even one suitable portable reading lamp once obtains foothold in the house of a user of electricity, it will, in the end, convert the larger part of his business into your channels.

Even more than in commercial lighting the convenience of electricity works against us. Good self-lighting burners, however, will prove efficient, and automatic electric lighting burners are very satisfactory and give very little trouble, if properly adjusted.

It is only within a few years that gas companies have awakened to the importance of advertising anything but fuel gas. It is the opinion of the writer that fuel gas has about reached the point where advertising is not necessary—it advertises itself—and rather than being considered a luxury it is now a necessity in every town. Why not, then, devote our energies, in a degree, to the pushing of the sale of our original product—illuminating gas?

A vote of thanks was passed to Mr. Douglas, after a discussion that lasted some time. Mr. A. L. Zwisler, of Coldwater, Michigan, then read the following paper, entitled

HOW DO WE OBTAIN OUR PATRONS?

When called upon at our last meeting to write a paper, I thought I should be unable to do so, as my experience in the gas business is limited. However, I thought I could inform you of how we obtain our patrons.

We make a house-to house and store-to-store canvass, and if we find a party with a second-hand oil or gasoline stove worth $2 that he will trade for a gas range, and at the same time ask $8 or $10 for his old stove, we always trade with him, even if we lose a few dollars in the trade. We advertise all of our stoves every day in the daily paper, whether put in on trial or sold; our "ad." reads something like this: "The Gas Company have connected up a new gas range for Mrs. Cook, 279 East Chicago street." If we happen to miss anyone they will come down to the office and inquire why we did not put their stove in the paper. If we lose a few dollars on a trade, we think we get even on the gas consumed in a month or two.

We have traded in the last two years for 50 gasoline stoves and have gas ranges in their places. One man in particular I bring to mind, for whom we ran a 100-foot service and connected him an $18 gas range, and for our pay took his gasoline stove and $10 in money. We figured we were out about $5 on the deal. The first month his gas bill was $6, and has averaged $4 per month since then. We now have a good customer burning gas in place of gasoline. This same man told one of his friends how he had beaten the gas company in trading them his old gasoline stove. We would like to have a few more beat us in the same way.

The officers and employees of the gas company have helped us in trading gas ranges, lamps and fixtures for groceries, shoes, clothing, dry goods, hardware, sewing machines, and, in fact, any old thing that they can use, and at the same time secure a customer.

We go into a store that is burning electric light and agree to put in all the lamps and fixtures they require to light their store and take our pay in what they save between electric light and gas. If in a month or so they are satisfied they are getting a better light for less money, we tell them we will take the fixtures and lamp account out in trade, and are pleased to say we have never had to take any lamps or fixtures out that we put in on trial.

At the end of every month we get a bill of our account and pay it to the Gas Company and give the customers credit for the same until the account is traded out.

In the spring of 1896 a man who lived 500 feet from our main wanted a gas range. I told him to talk with his neighbors and see if he could interest any of them. He tried it, and afterwards I tried to impress upon them the convenience of gas for light and fuel; but not one of them could I convince. Nevertheless, we ran our main and connected up the one lone range, and to-day have five more ranges on the same street—one party is using gas for light besides, but as yet we have not been able to sell him a range, although I think in another year we will be able to secure him.

We sell a Clark Jewel, 499 Range, at $16.20. As you are aware of the exact cost of these ranges, you will see it gives us a little margin to trade on. We always keep the name of every party to whom we talk gas, and if we are unable to sell him the first season, we commence again the next spring until he buys or drives us out. If a new resident comes to our city we are the first ones to see him—if he is going into the mercantile business we endeavor to obtain his business for the store; if he is looking for a house to rent, we take our horse and try and find him a house with gas in it, or where we are sure the landlord will put in gas, providing he gets a good tenant. We try to be on good terms not only with our customers but with those who are not as well. If anyone informs us where we can sell a gas range, we not only thank him but give him to understand we appreciate the service he has done us.

One of our customers was the means of our selling three gas ranges. After I had closed up the third deal, I asked him to have his wife come into the office and select a portable, as I wanted to make her a present. They came in and picked out a cheap portable, but I gave them the best one we had, and do not think I have lost anything for the Company by so doing.

We seldom ask a party to buy a gas range until after he has tried it, and if not satisfactory we take it out, and all the expense to him is the gas consumed. A man came into our office one afternoon last July and looked at a gas range. After showing and explaining the beauty of the gas range to him, he said he would have his wife come down and look at it. I told him his wife could look at it a great deal better in her own kitchen, and if not satisfactory we would take it out; he said he must have a stove to get supper on as his wood stove had given out. I told him we would have it connected in time for supper, and after using it for supper and breakfast he came down to the office the next morning bright and early and paid for it, and said we could not take that range away from his wife at any price.

Our Company have connected up over 200 ranges in the past four years, and have only taken out two of this number.

A satisfactory discussion on Mr. Zwisler's paper was closed by a vote of thanks to him.

The President called for the

REPORT OF THE COMMITTEE ON NEXT PLACE OF MEETING,

which was as follows:

To the Michigan Gas Association: Gentlemen—Your Committee on Next Place of Meeting beg leave to suggest Detroit as such place, and desire to present the accompanying letters in support of their suggestions. Respectfully submitted,

J. J. HOWDEN,
W. D. WALBRIDGE,
L. M. LATTA,
} Committee.

The letters referred to were forwarded by: William C. Maybury,

Mayor of Detroit; O. A. Bierce, Secretary Business Men's League, Detroit; and F. W. Waring, Secretary and Treasurer, Board of Trade, Detroit.

On motion the report was accepted, and Detroit was named as the meeting place.

REPORT OF COMMITTEE ON NOMINATIONS.

The Committee on Nominations handed in the following report:

Gentlemen: Your Committee on Nominations would respectfully recommend the following officers for the ensuing year:

President—L. E. Walker, Lansing, Mich.
Vice-President—J. J. Howden, Muskegon, Mich.
Secretary and Treasurer—H. H. Hyde, Mich.

W. M. EATON,
JNO. R. LYNN,
E. F. GALLAGHER, } Committee.

ELECTION OF OFFICERS.

The report was accepted, and the gentlemen named were declared duly elected to the positions named.

On motion, the annual compensation of the Secretary and Treasurer was increased to $75 per annum. President-elect Walker and Secretary Hyde having made appropriate responses respecting the positions to which they had been chosen, the following

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS

was read and adopted:

To the Michigan Gas Association: We, the Committee to whom was referred the President's address, cannot but recommend a careful consideration of the same to the members of the Association, and to all engaged in our business.

Like him, we welcome the promised new era of prosperity, and feel assured that its effects upon our industry will prove wholesome and satisfactory.

Much has been accomplished by incandescent gas lighting, and further advancement rests in a measure upon our own shoulders.

In regard to acetylene and its future field we are of the opinion that its use will not greatly conflict with artificial gas as at present distributed to the public—at least not for some time to come.

The remarks in reference to the coke oven process are worthy of careful attention, as therein lies the possibility of cheap fuel gas. Its success, however, has not been demonstrated at present, and time alone can eventually bring a satisfactory solution of the subject. The subject of the disposal of coal tar is at this moment exceedingly important to coal gas companies, and your Committee firmly believes that the only method of restoring that by-product is to consume it for fuel until the supply for the trade becomes so limited that buyers must necessarily come to terms.

Your Committee heartily indorses the estimate placed upon the valuable services of our Secretary, and would recommend that members themselves make a greater effort in the future, than has appeared in the past, to strengthen his hands and assist him in the work, which has almost devolved upon him alone. Upon the technical education of our young men we consider the references well taken, and would impress upon all such the importance of carefully studying the many technical and scientific points of the business, and of also neglecting none of a practical nature. The successful gas manager of the future will undoubtedly be that man who will combine practical and theoretical knowledge with keen, honest business ability.

ISAAC C. BAXTER,
PAUL DOTY,
W. J. BOSTWICK, } Committee.

REPORT OF COMMITTEE ON RESOLUTIONS.

The Committee on Resolutions submitted the following report, which was, on motion, adopted:

To the Michigan Gas Association—Gentlemen:

Whereas, The sixth annual meeting of the Michigan Gas Association is about to adjourn; be it

Resolved, That our thanks be tendered to the Lansing Gas Light Company, to the Committee of Arrangements, and to the others who have so carefully and thoroughly entertained our members, and whose favors cannot be too highly appreciated; be it further

Resolved, That we thank our worthy officers for the thorough manner in which they have performed every duty and assisted to make this meeting a success. And,

Whereas, By the death of William M. Coombs, late President of the Coldwater Gas Company, this Association has lost an active member whom we esteemed for his personal worth, high character and good business ability. Therefore, be it

Resolved, That your Committee commends to this Association his noble example and pure life, and extends to his family the sympathy of this Association in this hour of their sadness. Be it

Resolved, That this resolution be entered on the minutes of the Association, and that the Secretary be requested to mail a copy of the same to relatives of our deceased member.

S. DEAN,
F. H. HESS,
J. T. LYNN, } Committee.

REPORT OF COMMITTEE ON COAL TAR.

The report of the Committee on Coal Tar, which was made verbally, by Mr. J. J. Knight, of Kalamazoo, Mich., was discussed. The debate was closed by the adoption of a resolution to continue the Committee for another year, and to add to its membership the President and the Secretary.

President-elect Walker extended the courtesies and freedom of the State Capitol, and of the local Industrial School as well, to the members who remained in the city during the afternoon. No further business offering, the meeting was declared adjourned.

Innovation in and Future of the Water Gas Industry.[1]

[Adapted and translated for the JOURNAL, by Mr. F. Egner, from a paper read by Mr. H. CROISSANT, Manager of the Ludwigshafen gas works, at a meeting of the Mid-Rhenish Association of Gas and Water Engineers.]

Before turning to the real subject of this paper, I would like briefly to review the differences which are typical of the two methods of producing gas from coals. While the production of coal gas is one of distillation, the manufacture of water or "power gas" is characterized as one of oxidation. To obtain straight illuminating gas only gas coals are suitable; but in the manufacture of water gas not only can any kind of gas coal be used, but anthracite and coke as well.

The process of distillation requires exclusion of the air, and consequent separating of the heating and distilling spaces. The process of oxidation on the contrary requires oxygen; and, therefore, the heating and gas producing room can be put into one, so that the gas generator consists of a most simple square or round shaft, either with or without a grate.

Since at this date generators are erected with an hourly production of from 21,884 to 24,798 cubic feet, it follows, if we take into consideration the latest calculations of Dr. Strache, of Vienna, that with a single apparatus of that kind we can obtain as much illuminating effect, by employing the Welsbach burner, as with 6 or 7, and with Dr. Strache's latest improvements, 9 to 11, of the customary regenerative retort benches with nine retorts each. But in heating power such a generator produces only about what three or four such benches may turn out.

For reasons which will not be now touched upon, water gas could not get a sure footing in Europe, until the introduction of the incandescent lamp.

A few far-sighted ones at once recognized the great value of Dr. Auer's invention as bearing upon the future of these non-illuminating gases, and their labors in the realms of production as well as application, especially in the field of illumination, can show successes which, though as yet but slowly still surely, lead us to look forward to a revolution in favor of water gas.

As generally understood, water gas is obtained when we conduct vapors of water through glowing coals. One then obtains a mixture of carbonic oxide and hydrogen, with a very small admixture of carbonic acid, nitrogen and oxygen. The best results are only obtained at high temperatures, because the critical temperatures of steam and carbon oxides are high. The decomposition of steam absorbs heat, by reason of which the introduction of steam must be interrupted after a while, in order that, by fresh introduction of atmospheric air by means of blowers, and consequent burning of the fuel, the temperature of the generator may be again suitably increased.

The primary efforts were to increase the gas making period and proportionately shorten the blast or heating up time; secondly, that only water gas would be produced and not a generator gas as a by product; thirdly, it was aimed to make the producing (or useful effectiveness) power of the generators as high as possible.

As it will be understood by the preceding that the consumption of heat increases in proportion with the production of gas, and that a

1. *Journal fur Gasbeleuchtung.*

shortening of the blast period means an increase of efficiency of the generator, it follows that during the shortened period of heating up, more heating matter must be conveyed to the apparatus than formerly, when the gas period was shorter. This was accomplished in two ways:

1st. One does not as formerly blow to obtain generator gas (CO + N), by means of which one obtained 2,470 calories by the expenditure of 2.204 pounds of carbon in the generator, but to accomplish complete combustion (CO_2 + N), through which the generator receives 8,080 calories per 2.204 pounds of carbon, or more than three times as much heat as formerly. This is according to Dellwick's process, who claims in his patent that any water gas process containing more than 13 per cent. carbonic acid in the waste gases is his invention.

2d. One blows, as formerly, to obtain carbonic oxide, but makes use of this to preheat both the steam and air to be employed in the generator, through which means theoretically as much heat would be conveyed into the generator as in the Dellwick process.

This later process was patented by Dr. Strache, of Vienna; but with it it becomes necessary to connect to the generator a regenerator in which the generator gas is burned while still hot. This immediate burning of the generator gas results in a high efficiency, as we have learned in our practice with regenerator furnaces in coal gas manufacture.

The checkerboard-like brickwork in the regenerator becomes incandescent during the blowing period, and the steam or air conducted through it reaches the generator highly heated. In both methods, therefore, the increase of heat in the short blasting, between the gassing periods, is accompanied by the complete elimination of that useless by-product, generator gas, which has only in rare instances ever approached a production of useful effect.

Both of these processes exhaust most intensely the heating power of the coals used, so that by these means alone the useful effect of same is greatly increased. The lengthened gassing periods result in that, with generators of like dimensions, it is possible to obtain largely increased quantities of gas, so that to obtain like quantities of gas, generators of smaller dimensions may be operated, which brings with it a reduction of the loss by radiation and from other causes.

The construction of the Dellwick generators is as simple as that of the old coal gas systems. In operation it is simpler than the latter, because it is much more sensitive to variations in temperatures. The workman who attends the generator is reminded, by means of a bell singal, when it becomes necessary to change from the heating to the gassing period. It is less dangerous than the old style generators, since, when operating with the view of complete combustion, the chances of explosions through unconsumed CO are entirely elimimated. By reason of their extreme simplicity, the generators are very durable and require fewer repairs.

At any rate water gas installations of the Dellwick system can be erected very cheaply; and if gas for power only is desired, the apparatus would not cost greatly more than that used to produce Dowson gas.

It is found that with the Dellwick generator, not counting the fuel required to produce steam, 24.29 pounds of coal will produce 1,000 cubic feet of water gas. (In considering these figures the reader is reminded that the latter means *all water gas*, with no admixture of gas from the four or more gallons of oil present in our carbureted water gas; consequently 1,000 cubic feet of uncarbureted water gas.—F. E.)

One kg. of carbon gives, therefore, from 2.4 to 2.5 cb.m. of water gas (equal to 38.45 to 41.17 cubic feet of gas per pound of carbon—F.E.), which presents a useful effect of from 72 to 76 per cent. of the energy contained in the coal, and is a result not approached by the best steam boiler practice.

The average composition of this water gas is as follows: 40.4 per cent. carbonic oxide; 51 hydrogen; 0.5 methane; 3.6 carbonic acid; 4.5 nitrogen; and consequently 1,000 cubic feet would evolve 319,328.8 B.T.U.

While with the old methods the gas period was 15 and the heating up period 45 minutes per hour, with the Dellwick process the blowing up period consumes only 7½ to 8½ minutes, and the other 51½ to 52½ minutes are employed to produce gas.

One of the requisites to obtain best gassing results with the Dellwick process is that, during the blowing up period, the fuel shall be completely burned, so that the waste gases contain mostly only carbonic acid.

To date, these generators could only employ coke with advantage; but it could be wished, if, like in the "Strache generators," all kinds of coals (meaning gas coals, for anthracite is rare and costly over there—F. E.), could be used.

The "Strache generator" contains a space in the upper end in which the coal is first distilled before oxidizing to water gas. The volatile hydrocarbons thus liberated are mixed with superheated steam and conducted over the gas-freed coal in the lower part of the generator, where they are decomposed to water vapor and carbon, where simultaneously this vapor is converted into its component parts of water gas. It is to be mentioned in this connection that the carbon freed during the distillation of the gas coals is of no value in the production of water gas, but only reappears as mud and dust in the condensing and scrubbing water.

"The gas is richer in hydrogen than the ordinary water gas, which is of great value when the gas is to be used for illuminating (by means of the incandescent burner—F. E.) purposes, because the flame temperature increases with the augmentation of the hydrogen contained therein, and the illuminating power of the incandescent body becomes greater, and its durability also through the same cause."

With his small apparatus of 1,765.7 cubic feet per hour capacity, Dr. Strache obtains 20.03 cubic feet of water gas per pound of coal; but he expects to get 34.04 cubic feet of gas per pound of coal by employing larger apparatus and preheating the air and superheating the steam. This means that he will get back 66 per cent. of the heat value of the coal, while about 12 per cent. is found in the water of the condensing apparatus, which latter proves to be a heavy source of loss, and which perhaps could be greatly compensated by a more suitable design in construction.

One great advantage of the process is that any kind of coal (gas coal—F. E.) can be used in the generator, so that one becomes independent of particular sources of supply, which is especially of value to such as are located a great distance from coke works or gas coal fields, but who have nearby means of obtaining low grade coals.

But the Strache process becomes complicated and more expensive by reason of the efforts to utilize some of the gas produced for use in the process itself. Neither is it longer as simple in operation, because, beside the changing of valves for air, steam and gas, there is another valve to be attended to, with the object of conveying the generator gas to the regenerator and to take along with it the gases produced in the primary distillation.

Like with the Dellwick so in the Strache generator, the periods of heating up are shortened and the gassing periods increased, through which means small generators have a comparatively high producing power.

The Dellwick and the Strache generators come up to the demands made upon them very well indeed, of which I have assured myself by personal inspection, and they can be brought from a cold state into full activity quickly.

But not only in manufacture, but in the field of application as well, decided progress is to be noted.

It has been demonstrated that with suitable construction of the burners, water gas, by reason of its high flame temperature, gives a much greater lighting effect by means of the incandescent burner than does the coal gas of to-day.

According to Dr. Strache his burners, constructed to give 25, 50, 80, 120 and 150 Hk. (the German standard—F. E.) illumination, consume 1.2 to 1.7 liters of gas per Hk. hour; whereas with ordinary coal gas, 2 liters are required to give the same amount of light with the same burners.

During the summer of 1898 I had an opportunity to see and investigate for myself some of Dr. Strache's burners, at his experimental station at Modling, near Vienna, which is the same institution to which afterwards was transferred the Vienna Hospital.

I had an opportunity to compare the light given by the incandescent burner, when the heat was produced with ordinary illuminating as well as with plain water gas, and this, with the burners ranged side by side.

With water gas the incandescent body gives an agreeable, yellowish, soft, though brilliant, light, which approximates closely to the acetylene light. The incandescent body appears as if it were composed of a glowing liquid. The incandescent body heated by means of illuminating gas on the contrary has a dead greenish glow, very deprecating to colors.

Dr. Strache had constructed a burner (of his system) which I know was from 900 to 1,000-candle power, and which at the least accomplished its work—that of lighting up the yard of the factory—as well as any elecric arc lamp could have done; but which was much cheaper.

I also saw there the Fahnehjelm incandescent burners, and became convinced that they would be a good substitute for Argand or slit burners, giving more light at a less cost than these; and it would appear that one ought to rejoice to be able at last to get rid of those gas eaters and heat radiators.

[In the preceding lines Mr. Croissant refers to a very ingenious table, on which are given figures, showing the cost of lighting by means of American and German carbide of calcium; electric glow and arc lamps; incandescent gas light by means of illuminating, and the same by means of plain water gas; as well as lighting "straight" with illuminating gas, using Argand burners. Not only is the cost shown, but other interesting (to the German professional man) data are given, which, however, would hardly be appreciated by readers of the JOURNAL, since they apply mainly to European (Continental at that) conditions. This, together with another table, showing the same items, but by means of diagrammatic curves, is omitted for the reasons stated. But both tables serve to illustrate the distinguished ability of the author of the original paper—F. E.]

The present burners of Dr. Strache are not furnished with the Bunsen tube. However, it may be assumed that the lighting effect would be increased if these were added; of course, they would have to be somewhat modified in design, and differ somewhat from the kind now in use.

By reason of the very small amount of ammonia in the gas, and small consumption per flame, the atmosphere within any room is affected but slightly, while the small heating effect of the gas reduces the often disagreeable sensible heat to about one-third of that due to combustion of coal gas for like service. One can hold the bare hand over a 50-candle power, water gas glow lamp, without feeling the least unpleasant sensation; and a strip of paper held over the same flame, will not be scorched. Viewed from a hygienic standpoint, the introduction of water gas may be regarded as distinctly progressive.

(To be Concluded.)

Address of the Vice-President[1] (Mr. E. H. Jenkins, Buffalo, N. Y.), on the Occasion of the Fifteenth Annual Meeting of the Ohio Gas Light Association.

Gentlemen of the Ohio Gas Light Association: One year ago, at our meeting in Cleveland, Ohio, it gave us great pleasure in selecting for the highest position in this Association one whom we all loved as a brother and respected as an associate—Mr. B. P. Holmes, of Youngstown, Ohio; and we looked forward with pleasant anticipation to the time when he should preside over the deliberations of this meeting. But He who rules the universe has decreed otherwise, and we bow our heads in sorrow to-day, knowing that never again shall we receive the kindly greeting, the hearty clasp of the hand from our friend and brother.

The past year has been a fairly prosperous one to the companies whose representatives are gathered here to-day. No serious disaster has happened any one of them; but each has made good progress, local conditions being considered. Throughout the country generally there has been, and is, a stronger feeling of confidence in the gas business, and the future promises well. Closer attention is being given to the various details of the business in all its branches, and we can safely say that it is on a better and safer footing to-day than ever before in its history.

At least two striking examples have been placed before us in the past year, of the results of the establishment of opposition gas companies; and the "oft-told-tale" has been repeated again. One is forced to ask, "Will these costly lessons ever convince the citizen and taxpayer that the inevitable result of such opposition is to put off just that much longer the day when gas can be profitably sold at a lower price, by adding increased investment in plants, invariably and unnecessarily duplicating existing systems, and consequently increasing capital, making increased fixed charges for interest and maintenance without increasing the business a particle?"

At the eleventh annual meeting of this Association, held in this city in 1895, Mr. W. W. Goodwin made one of the first exhibits of the light from acetylene gas, and his remarks in regard to the then proposed active competitor in artificial illumination were extremely interesting to the members. At the meeting in Cincinnati (1896) the members of the Association were invited to another exhibit of this gas, which was being made by a few promoters. Quite a number of patents have been granted for apparatus for producing acetylene gas, and much money has been expended in attempting to promote this industry. After four years of thorough experiments, and the utilizing of the current produced by the Falls of Niagara in the production of the carbide, the price to the consumer to-day is $75 to $80 per ton. I cannot, therefore, see that we need fear very much from this new candidate in the field of artificial illumination. In this connection, however, we will watch closely the experiments which it is reported are being made at Wabash, Ind., with acetylene gas.

If one looks back say 20 years, when the average price charged for gas was near the $3 per 1,000 mark, and when the only real competitor was the coal oil lamp, and considers the present time when the average price of gas is near the $1 mark, and such lively competition to contend with as natural gas, electric light and vastly improved oil lamps, not to say anything of acetylene gas and the various forms of gasoline gas machines, he cannot but feel proud of the ability of those who have been able, through all these years of competition and strife, to bring the gas industry to so high a place among the various industries of the United States.

I am a firm believer in the stability of the artificial gas business, and see no reason why we should not in the future, as we have in the past, "hold our own against all comers."

At the last meeting of this Association a committee was appointed to consider the question of municipal control, and we are promised a report from them at this meeting. As a rule the question is not one of municipal control but rather municipal ownership of all quasi-public industries—this not only affects gas companies but also electric light, street railway, telephone and water companies. City officials and others who are agitating this question of municipal ownership seldom have any experience in the practical working or operation of any one of the industries named, yet they are perfectly willing to invest the taxpayers' money in, and undertake to manage, either one of the above lines of business, and will assure the public that they can manufacture gas, produce electricity or run a street railway a great deal cheaper than those who in many instances have spent their life time in managing such industries. In a majority of cases these same officials have not been successful in operating a small retail store or corner grocery, yet they do not hesitate to assume the management of a business involving the expenditure of hundreds of thousands of dollars.

Municipal ownership has become the popular idea almost entirely through misrepresentation of facts. A city erects a lighting plant and runs it for a few months, and the city officials, desirous of showing the taxpayers of that particular city what a splendid investment they have made, get up an estimate of the business being done and the great saving *to be* made. The newspapers of the city desirous of showing to their neighboring cities how much more progressive their city is than those about them, publish these estimates as facts, and perhaps throw in a few extra figures to make the showing big. The other newspapers, taking these statements as actual results, make the usual glowing comments about what is being accomplished in the first city, and insist that their officials go and do likewise. If the first named city ever does attempt to keep an honest set of books, and compels the lighting plant to show its rightful expense, they will be so chagrined at the showing, that they will keep very quiet about it; and the dear public have been shown only the glowing "promoter's" side of the scheme. A carefully prepared statement of the result of the municipal undertakings in the United States, prepared by a disinterested committee, on a basis similar to that followed by the Massachusetts Board of Gas and Electric Light Commissioners, would prove that, in 99 cases out of 100, the citizens would save money for the taxpayers by making fair contracts for such service with private ownership companies—by fair contract I mean one that would be at a price consistent with first class service, and earning a reasonable interest on the investment, and for a term that would put the private company in a position to feel justified in the necessary expenditure for equipment to carry out such contract. Municipal control would then be to see that such contracts were properly made, and afterwards to see that both parties lived up to them in all respects.

The subject of gas for street lighting is becoming quite an interesting one for the gas manager, and the persistent, steady efforts being made by some of the gas companies are demonstrating the fact that in many cities a better service, a more evenly distributed light, can be produced by artificial gas with Welsbach burners than with the expensive electric lights. This subject is to be carefully handled in a paper by Mr. J. W. R. Cline; and in connection therewith we are promised an exhibit of street lighting by the Welsbach Street Lighting Company. The other papers to be presented for your consideration are upon thoroughly practical subjects and will be of interest to every one present. I trust there will be a full and free discussion of every paper read, as the information brought out in this way adds to the value of the paper. In this connection I also ask that you let no item from the Question Box pass by without giving it full and thorough consideration. Remember, these questions are asked in good faith by our members, and

1. The President of the Association (Mr. B. P. Holmes) died Feb. 12.

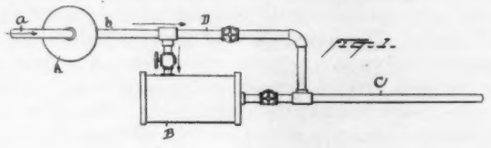
if properly answered will be of benefit to the members of the Association as well as to the ones who ask them.

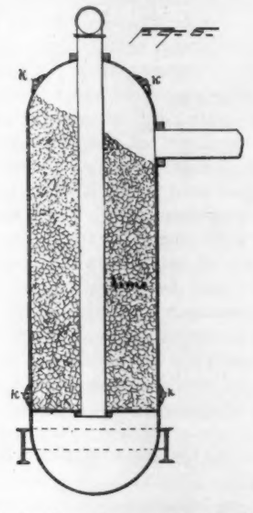
The local Committee of Arrangements have prepared an excellent programme for our entertainment, and I am sure we all feel that we are fortunate in again meeting in the beautiful city of Springfield. And now, gentlemen, the meeting is in your hands. I ask that each of you feel that he is responsible for his share of making it a success.

Hequembourg's Method of and Apparatus for Dehydrating Gas.

On the 7th inst. U. S. Letters Patent (No. 620,773) were granted to Mr. C. E. Hequembourg, of Dunkirk, N. Y., for a new and useful improvement in pipe line systems. Using the words of the specification:

In the transmission of natural gas through pipe lines to distant points it has been observed that the delivery of the gas by the same plant decreases in cold weather. This has been attributed by many to a reduction in pressure at the wells themselves. I have found out, however, that it is not due to this cause, but to a reduction in the capacity of the pipe line produced by the condensation and freezing within the pipe of the watery vapor carried by the gas and the more easily condensed constituents of the gas itself. This vapor is either condensed into a liquid and frozen in the pipe in a solid form or collects as a hoar frost within the pipe at the most exposed points. The mechanical separators which are ordinarily used at the gas wells themselves, while removing a large amount of water which is carried along by the flow of the gas, do not remove the vapors referred to, which, notwithstanding such separators, remain in the gas in such large quantities that when condensed they will form for each one million feet of gas a quantity of liquid amounting in most cases to several gallons. The difficulties arising from the condensation and freezing of these vapors in the pipe become of great moment where the gas is transported to considerable distances, because the longer the pipe line the greater is the expense of providing for an extra capacity in the line itself and the greater is the difficulty of removing the accumulation from the pipe by any of the ordinary expedients. By my present invention I do away with this



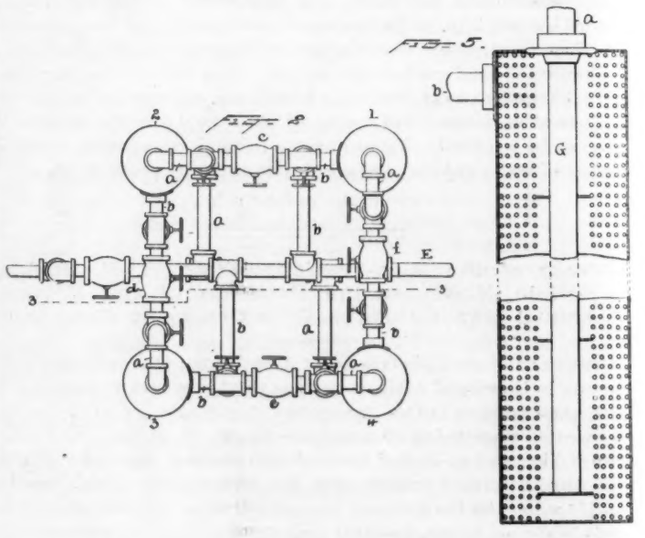


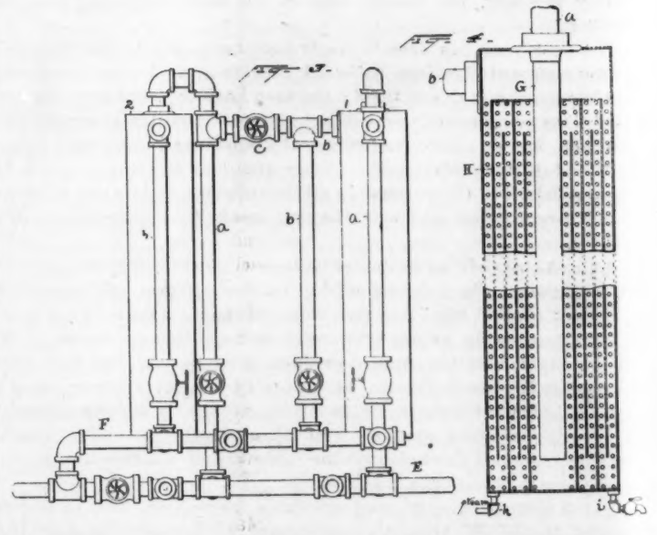
difficulty by drying or dehydrating the gas before it enters the pipe line. For this purpose I may employ either a refrigerating method wherein the gas is passed over artificially cooled surfaces which condense the watery vapors and the easily condensed constituents of the gas itself, or an absorption method wherein the gas is passed over or through anhydrous substances which absorb these same vapors. In either case the process is carried to that extent that substantially all the vapor is removed from the gas which would be condensed by the lowest temperature to which the gas would be subjected in transmission through the pipe line, and in the case of the refrigerating method this means that the gas shall be subjected to at least as low a temperature as it will reach at the most exposed points of the pipe line.

In the accompanying drawings, forming a part hereof, Figure 1 is a diagrammatic view illustrating the principle of the apparatus employed. Fig. 2 is a top view of a series of the vapor removing tanks. Fig. 3 is a vertical section on line 3 3 in Fig. 2. Fig. 4 is a vertical section of one of the tanks employed in the refrigerating process. Fig. 5 is a vertical section of a modified form of the refrigerating tank, and Fig. 6 is a vertical section of one of the tanks employed in the absorption process.

Referring particularly to Fig. 1, *A* represents the drying apparatus, having inlet and outlet pipes *a b*. The inlet pipe *a* is connected with the field lines running to the gas wells. The outlet pipe *b* is connected with the inlet of the pump or compressor *B*, the outlet of which is connected with the pipe line *C*. A by-pass *D* is shown, by means of which and suitable valves the gas may be passed around the pump or compressor where the natural pressure of the wells is sufficiently high. The drying apparatus will be arranged in sections, so that any part of it can be thrown out of use for cleaning.

By the preferred form of apparatus I employ four drying tanks, 1, 2, 3 and 4, which have their inlet pipes *a* connected independently with





the supply pipe *E* from the field lines, and having their outlet pipes *b* connected independently with the discharge pipe *F*. In Fig. 3 the pipes *E* and *F* are shown as continuous, with an intermediate shut-off valve, the purpose of which is to permit the gas to flow by the drying apparatus, if required. The four tanks are also connected together by pipes *c*, *d*, *e* and *f*. Pipe *c* connects the outlet of tank 1 with the inlet of tank 2. Pipe *d* connects the outlet of tank 2 with the inlet of tank 3. Pipe *e* connects the outlet of tank 3 with the inlet pipe of tank 4, and pipe *f* connects the outlet of tank 4 with the inlet pipe of tank 1. Suitable valves are provided, as shown. By this arrangement the gas from pipe *E* can be passed simultaneously or successively through all the tanks or through any desired number less than all.

I prefer to make each tank with a capacity to take the full flow of the gas and to pass the gas in series through three tanks at a time, leaving one tank always out of operation.

For the refrigerating process the tank shown in Fig. 4 or that of Fig. 5 is employed, having within it a considerable length of piping *G*, arranged in a suitable manner and provided also with division plates *H* for causing the gas to circulate back and forth around the coils of pipes, as shown in Fig. 4, although these division plates may be omitted, as shown in Fig. 5. Through the piping *G* is circulated in any suitable manner chilled brine or expanded ammonia or other suitable vapor or gas, as is well understood in connection with refrigerating apparatus. The vapors in the natural gas are condensed by the cooling surfaces and adhere to such surfaces as a hoar frost. When required, any one of the tanks can be put out of service and steam admitted into the gas space through the pipe *h* for melting the accumulations upon the cooling surfaces, the liquid being drawn off through the cock *i*.

A tank suitable for the apparatus when the absorption process is employed is shown in vertical section in Fig. 6. This is an open tank with a perforated bottom, upon which rests the filling of lime, chloride of calcium, or other anhydrous material, through which the gas is caused to circulate in passing from the inlet to the outlet of the tank. The tank is also provided with suitable manholes *k* for removing the material and refilling.

While my invention is especially designed for the transmission of natural gas through pipe lines, it is also applicable to manufactured gas or to air where either is transmitted to a distance through a pipe line.

The inventor's claims are :

1. In the art of transporting natural gas through a pipe line, and the prevention of the condensation and freezing of vapor in the pipe line, the improvement which consists in passing the gas before it enters the pipe line into contact with refrigerating surfaces, maintained at a temperature sufficiently low to condense and freeze the vapors thereon, then in subjecting such surfaces to a sufficiently high temperature to melt the frozen condensed vapors, and finally in removing the water produced by the melting of such frozen vapors, substantially as described.

2. The improvement, which consists in passing the gas before it enters the pipe line in contact with refrigerating surfaces maintained at a temperature sufficiently low to condense and freeze the vapors thereon, then in cutting off the supply of gas to such refrigerating surfaces, and finally in subjecting such surfaces to a sufficiently high temperature to melt the frozen condensed vapors, substantially as described.

3. An improved dehydrating apparatus for freezing the vapors contained in natural gas, comprising a receptacle through which the gas is passed, means within said receptacle for maintaining a temperature therein below that of the gas to congeal the moisture in the gas, means for melting the congealed mass, and an exit pipe for the liquid opening near the bottom of the receptacle to effect the removal of the liquid, substantially as described.

4. A freezing coil in said receptacle for maintaining the temperature in the receptacle below that of the gas to congeal the moisture in the gas, means for melting the congealed mass, and an exit pipe for the liquid, opening near the bottom of the receptacle to effect the removal of the liquid from the receptacle, substantially as described.

5. In a pipe line system, the combination with the supply pipe and the pipe line, of a series of intermediate drying or dehydrating apparatus, pipes connecting each apparatus with the supply pipe, pipes connecting each apparatus with the pipe line, and pipes connecting adjacent apparatus with each other, whereby the gas in passing from the supply pipe to the pipe line may be directed through any one or more of said drying or dehydrating apparatus, substantially as described.

A Few Practical Notes on Main Laying.

By Mr. Lester Price, Evanston, Ills.

A great deal of attention has been given in the last few years to the question, "Which is the best material for street mains—wrought or cast iron?" and to this day it remains a bone of contention. The cost of the pipe, the price at which it can be laid in the trench, the soil in which the pipe is laid, the cost of keeping same in repair, and which, if either, gives the least percentage of leakage, are all points that must be carefully considered.

The extended use of wrought iron at the present time (I refer to pipe 6 inches and under in diameter) would seem to indicate that it is rapidly growing in favor. Certainly its ease and economy in laying, with its slightly lessened cost per foot as compared with cast iron, are features that commend themselves, if the question of leakage and durability is satisfactorily determined.

Here in Evanston in the last few years, where the Northwestern Gas Light and Coke Company have been compelled, owing to the extensive street paving, to renew or relay a great deal of our mains, I have found wrought iron pipe, that had been buried for years in a section of the city where the soil is of a sandy nature, in a well preserved state and in just as good a condition as the cast iron laid about the same time. In another portion where the soil runs to a thick, heavy clay, the wrought iron pipe was found badly corroded, while the cast iron was still in fair shape. More or less leakage was found in nearly all the joints of the cast iron, and in some cases—owing to expansion and contraction—the lead was drawn nearly half an inch. Less trouble on the contrary was experienced with the wrought iron, for where corrosion had not actually taken place, and due care used in placing expansion joints, a much smaller percentage of leakage was encountered.

We make it a rule to lay our pipes below the frost line, the average depth being 4 feet; and where we have been able to use the wrought iron (and we never hesitate to do so where there is no clay) it has resulted in a saving of between 3 and 4 cents per lineal foot, as the following comparison will show :

4-Inch Cast Iron.	Cost per Foot.	4-Inch Wrought Iron.	Cost per Foot.
Material	.163	Material	.15
Digging and filling	.07	Digging and filling	.068
Caulker and two helpers	.025	Pipe layer and two helpers	.017
Lead, yarn, blocking, etc.	.019	Red lead paint, blocking, etc.	.007
Total	.277	Total	.242

We use no cement joints, but I think it has been established beyond doubt that a cement joint, if left undisturbed, is as near gas-tight as it is possible to make any joint; yet as pipe must expand and contract, and as the joint is rigid—so rigid, in fact, that there is absolutely no give to it—unless you place a lead joint of some kind every 200 or 300 feet there will be a great many breaks. I believe I should prefer to have the lead draw a little at each joint rather than have broken mains to contend with, especially in the winter time when they are hard to get at.

Distribution.—A great deal of judgment and foresight is required on the part of the gas engineer to determine just what size mains are adequate for the supply of any particular district. Besides estimating the immediate wants of the territory he must make provision for the future. He must know what size to make his main feeder, and he must see that the subsidiary mains, or those which branch in every direction from the main feeder, are large enough to equalize the pressure, thus avoiding, as the territory grows up and consumers increase, any excessive initial pressure at the works.

Pipe Laying.—Care should be taken that mains are not laid close to and parallel with water or sewer pipes, and certainly never in the same ditch, as any settling of either would quickly destroy the grade of the gas main if in close proximity. It is also important that the trench is straight and that it is bottomed out somewhere near level. A workman that is compelled to lay his pipe up hill, down dale and around corners, to accommodate all the twists and turns of a crooked ditch (as in Fig. 1), simply cannot make a job that will hold, I care not how good a calker or pipe layer he may be. If the run is not straight or approximately so (as in Fig. 2), the joints, having what is termed a "slack side," will sooner or later leak.

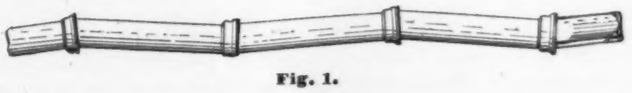


Fig. 1.

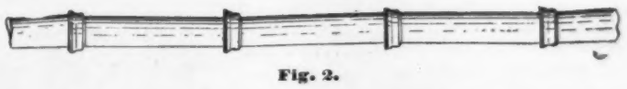


Fig. 2.

In laying pipe close watching is necessary on the part of the workmen to see that the lengths are sound and in good condition. Cracks are not easily seen at the best of times, especially those newly made, and, unless great care is exercised, a defective pipe will be overlooked and allowed to slip into the trench. Besides carefully inspecting each length, practice should be made—if it be cast iron—of striking it lightly with a hammer,

a sound and perfect pipe giving a clear, metallic ring. If a derrick is used this hammer test is best made when the pipe is overhanging the trench and swinging free from the tackle above. Every length should be thoroughly swabbed out and crowbars used after it is in the ditch and in position (but before leveling is done) to force it home and to see that the spigot end butts firmly against the adjoining pipe.

In wrought iron care must be taken when screwing the lengths together that they are not started in cross-threaded, and that the threads are clean and in good condition. If battered or otherwise damaged from rough handling it will be nearly impossible to screw the pipe well up to the shoulder. As to paint, two or three coats of some good heavy material, like the Cincinnati preparation, or an asphaltum, afford an excellent protection, preventing a corrosion and adding materially to the life of the pipe.

Lead Joints.—In making lead joints, neglect and oversight are probably more likely to happen than in any other. If the lead is cold, or there is not enough in the ladle to fill the joint at one pouring and the kettle man is obliged to replenish, the joint, when complete, will be less homogeneous and perfect. A careless workman is apt to shirk the proper calking on the under side of the pipe where it is hard to reach, and where bad workmanship is not so readily observed, or perhaps he is obliged, by reason of a treacherous ditch, to be constantly on the alert and thus compelled to hurry and slight the work. There is always danger, too, from improper yarning or a too persistent calking. The workmen must see that the yarn is not rammed beyond the spigot and into the adjoining pipe, and that sufficient is put in to cause the tool to spring back when impinged against it. Care must also be taken that the lead is not "drawn," by taking off the surplus with a cold chisel instead of the calking tool, and that the joint after being sufficiently calked is not loosened and upset by continued hammering. There is a time to quit, and a good workman should know when that is.

The quantity of lead required to make an average joint varies somewhat; but I prefer the following table:

Size Pipe.	Depth.	Thickness.	Weight.	Size Pipe.	Depth.	Thickness.	Weight.
3-in.	1½-in.	⅝-in.	3 lbs.	12-in.	1¾-in.	7/16-in.	13 lbs.
4-in.	1½-in.	⅝-in.	3½ "	16-in.	2-in.	7/16-in.	17 "
6-in.	1½-in.	⅝-in.	5 "	20-in.	2¼-in.	7/16 in.	21 "
8-in.	1⅝-in.	⅝-in.	7 "	24-in.	2¼-in.	½-in.	24 "
10-in.	1⅝-in.	7/16-in.	9 "	30-in.	2½-in.	½-in.	30 "

Back Filling.—This is a matter often slighted and frequently, in the hurry of getting in as many lengths of pipe per day as possible, the earth is thrown back in such a manner that the main is forced to one side, causing leakage. Besides a thorough blocking, rammers with bent ends should be used to pack the earth solidly and firmly around the pipe so as to afford it adequate support without danger of sliding or settling. The practice of laying gas mains without any blocks at all should be severely condemned. Crowding in a little dirt here and taking out a little there, in an attempt to hold the pipe in a permanent fixed position, is, in my opinion, a precarious way of laying mains, particularly in ground that is newly made. I think that every length of pipe, whether wrought or cast iron, should be firmly supported with wooden blocks in at least two places, and that this support (Fig. 3) should be at a point not far from the joint.

Fig. 3.

The size of blocks should depend somewhat upon the nature of the soil, wet and soggy ground naturally requiring a heavier blocking than where the soil is firm and hard. Here in Evanston, where both conditions are encountered, the following sizes seem sufficient:

Size of Pipe.	Size of Blocks. Length.	Breadth.	Thickness.
3-in., 4-in. and 6-in.....	10-in.	6-in.	1 in.
8-in., 10-in. and 12-in.....	16-in.	10 in.	1½-in.
16-in., 20-in. and 24-in.....	20-in.	12-in.	2-in.

Testing.—Never permit a foot of pipe to be covered up until every joint has been tested. The use of soap suds is better than a light, being less dangerous and a more positive detector of small leaks. Regular and systematic tests should also be made after completing the run, by means of a meter (Fig. 4), first seeing that all services or other openings on the new line of main are closed. If found impracticable to section off with valves, two rubber bags with a water seal between them (Fig. 5) will answer the purpose.

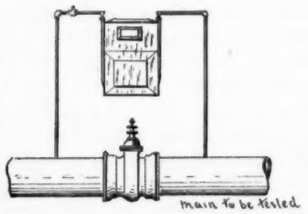


Fig. 4.

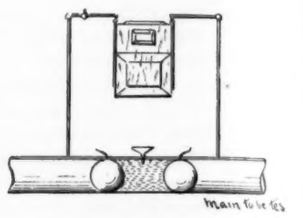


Fig. 5.

A great many gas companies, instead of using a meter for testing, employ a portable gasometer (Fig. 6), which enables the test to be made under a higher pressure than that already existing in the mains.

It operates as follows: After closing valve *A*, the gasometer commences to fill itself under ordinary street pressure through tube *B*. As soon as the top is reached the supply cock is closed and bell weighted

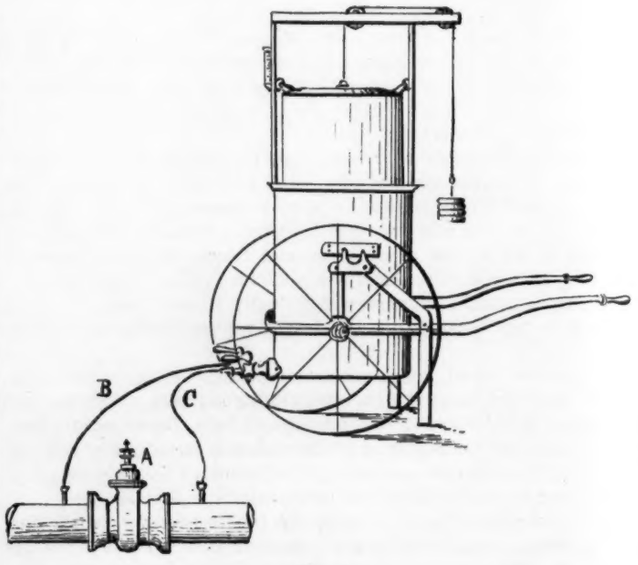


Fig. 6.

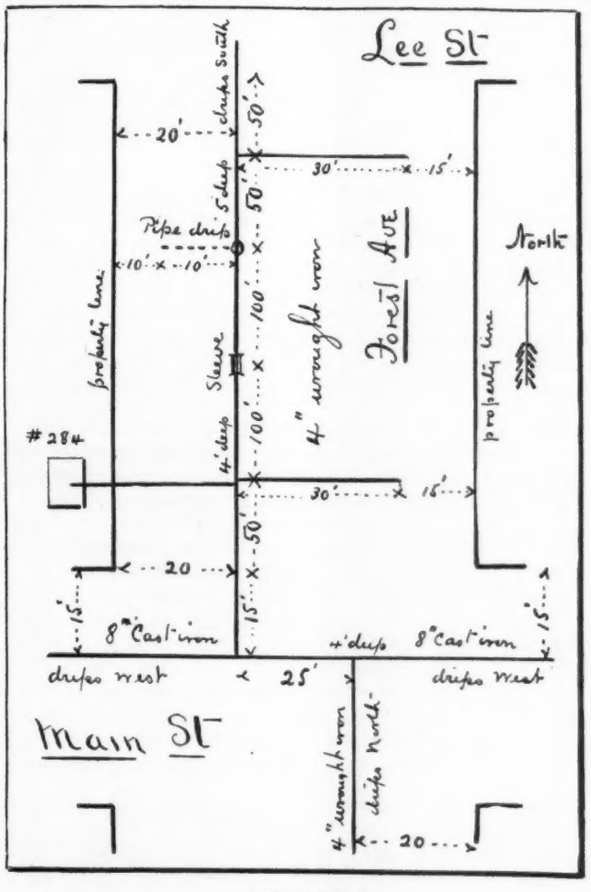
to give it higher pressure. Cock in tube *C* is then opened and the gas thus forced into the section to be tested. At first the movement of the bell will be quite rapid, or until the gas in the new main has been compressed; it will then remain stationary, if the section is tight, or continue to descend at a more regular pace if there is a leakage; the gauge and scale in the side, graduated into cubic feet, indicating the extent of loss.

In addition to the foregoing methods of determining leakage, another way sometimes resorted to is to fill the section under test with compressed air instead of gas—an air pump being used for the purpose. This method, however, while permitting a test to be made under excessively high pressure, involves considerably more labor and expense, and is, therefore, not commonly practiced.

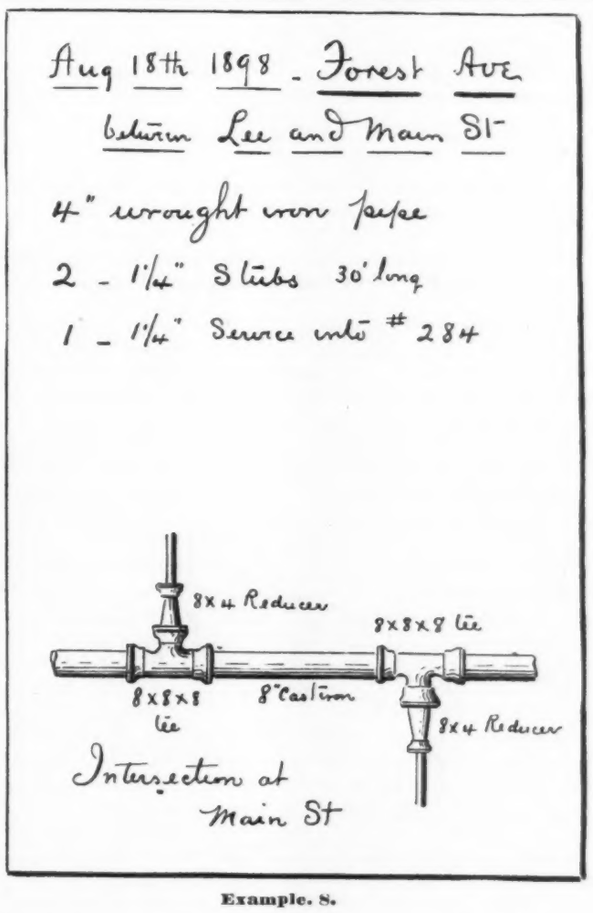
Office Records.—Every gas company should have on file, either in the form of memoranda or drawings, a full and accurate record of its street mains. It should show the location of every foot of pipe, of every special, drip, valve and service. It should indicate size, whether wrought or cast iron is used, depth of main, direction of grade and where the summits are. For this purpose a small pocketbook (4 inch by 6 inch in size), commonly called a "fieldbook," should be carried by the engineer or foreman, one page of which is used for a sketch of the block and the opposite for memoranda or an enlarged drawing of an intersection—see examples 7 and 8.

From this fieldbook, which is more or less in the rough, the work should be transferred neatly to the office chart, which is a large, complete and correct map of the distributing systems. Fittings, valves, drips, etc., can be shown on this map by appropriate symbols, while the size and kind of mains are best shown in colors.

In conclusion I would say that there is no part of the business too trivial for the personal attention of the manager or superintendent,



Example 7.



Example. 8.

whether it be the laying of mains, repairing leaks, or putting in services. Workmen unfortunately cannot always be depended upon in the absence of an overseer, and if any mistake is made they usually have it covered up before he arrives, thus hiding for days, maybe years, a blunder that is a constant drain on the profits of the company. It is not expected, of course, that he will be able to see everything, but if due caution is exercised in employing men and care taken that they are thoroughly accustomed to the work required of them, a great deal of worry and annoyance will be saved him and the earnings of the company much enhanced.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

THE proprietors of the Ogden Gas Company, of Chicago, have awarded to the Riter-Conley Manufacturing Company, of Pittsburgh, Pa., a contract for a storage holder, rated to a capacity of 2,500,000 cubic feet. It is to rest in a steel tank, the dimensions of which will be 174 feet in diameter by 31 feet deep. The holder will be of the four-lift order, and the guide framing is to depend on 22 columns.

A CORRESPONDENT writes us that the Springfield (Mass.) Gas Light Company has purchased two plots of land on Walker street, adjoining its present works site, the purchase having been made for the purpose of constructing in the near future a holder to have a capacity of at least 1,000,000 cubic feet.

AT the annual meeting of the shareholders in the Akron (Ohio) Gas Company, the reports submitted by the officers were pleasing and positive evidence to the fact that the Company's affairs are in flourishing condition, The retiring Board of Directors was re elected, and the Directors in turn re elected the following executive management: President, John R. Walsh; Vice President and General Manager, F. W. Little; Secretary and Treasurer, Lyman A. Walton.

THE proprietors of the *Electrical World* and of the *Electrical Engineer* have agreed to combine these publications, which dual paper is to be known as the *Electrical World and Electrical Engineer*. The editorial direction is in charge of Messrs. T. Comerford Martin and W. D. Weaver, and the business management is vested in Messrs. James A. Wakeman and A. C. Shaw.

WE understand that the authorities of Fond du Lac, Wis., have assented to the petition of the proprietors of the local Gas Company for an extension of its franchise for a period of 50 years. It is provided that the Company may not charge in excess of the following rates: For a supply on illuminating account, $2 per 1,000; on fuel and power account, $1.50.

IT is said that certain capitalists have offered the owners of the Easton (Pa.) Gas Company $115 per share for all of the stock in the Company; and it is further said that the owners will consider no bid less than $150 per share.

THE new showroom of the New Haven (Conn.) Gas Light Company, which is located in the Odd Fellows' Building on Crown street, is one of the most attractive places of business in the Elm city. The room is in charge of Mr. A. S. Thompson.

ADVICES from London, Ohio, under date of the 9th inst., are to this effect: "London is to have a modern gas plant, such decision having been reached at the recent annual meeting of the Company. The officers chosen were: G. G. Green, J. J. Clark, S. W. Durflinger, E. R. Florence, W. M. Jones and Foster Bury; President, W. M. Jones; Secretary, J. J. Clark."

AT the annual meeting of the Westminster (Md.) Gas Light Company the following officers were elected: Directors, John L. Reifsnider, Charles V. Wantz, Charles T. Reifsnider, Robert C. Hall, Wm. A. Cunningham, Chas. B. Roberts and John H. Cunningham; President, John L. Reifsnider.

THE Treasurer of the Northwestern Gas Light and Coke Company, of Evanston, Ills., has issued notice to the holders of 50 bonds, dated April 1st, 1889, and payable 10 years after said date at the office of the Prairie State National Bank, of Chicago, Ills., that the said bonds will be paid at the date of their maturity, the 1st prox., upon presentation to the Equitable Trust Company, 185 Dearborn street, Chicago.

THE Committee on Light, of the Richmond (Va.) City Council, at the instance of Mr. Ebel, has been instructed to investigate the condition of the municipal gas plant with a view to modernizing the same. The resolution also provides for an investigation and report upon the matter of the cost of installing an electric lighting plant to be operated on municipal account.

MR. WILLIAM EARLL, President of the Chico (Cal.) Gas Company, has authorized Mr. L. P. Lowe to construct for the Chico Company a water gas plant. It is reported that the plant will be in working order by June 1st, and it is further said that a pronounced cut in the Chico gas rate will be made when the betterments are completed.

THE same old story—that of the record of another successful year—was told at the 52d annual meeting of the shareholders in the Providence (R I.) Gas Company. The report of the Directors may thus be summarized: The sendout in 1898 amounted to 651,638,000 cubic feet, or something in excess of 9 per cent. over the output for 1897. The unaccounted for gas amounted to 24,878,000 cubic feet, or approximately, 3.82 per cent.—the lowest figure on that account since 1870. Of the gas made at both stations during the year, 56.42 per cent. was coal gas, the balance being water gas. The residual receipts were $66,956.76, or $17,408.15 in excess of the receipts on same account in 1897. The gas coal carbonized weighed 32,810 tons. The naphtha used amounted to considerably less than in 1897, as did the anthracite coal used, these decreases being chargeable to the fact that the make of coal gas was much greater in 1898 than in 1897. The increase in the street main pipes put down during the year figures out at 47,387 feet, and 2,982 feet of old pipe was replaced by new. The meters in use, Jan. 1, 1899, numbered 24,311, an increase during the year of 1,408. The number of services for buildings and lamp posts placed is returned at 932. The number of gas stoves put out and in use, January 1st last, is 11,825—an increase of 1,009. It has been decided to lay one mile of 20 inch street main this year. The payment to the city on account of franchise tax during the year was $18,458.13. The total receipt by the city on such payments amounts to $109,847.37. Arrangements are now in progress for rebuilding one retort house, and for building a new purifying house at the South Station; for laying a pipe under and across Seekonk river for a more adequate supply of gas to the East Providence district; and for changing the Federal street holder from single to double section. The Company has acquired land on Globe street opposite the West Station, with a view to erecting thereon a holder up to retaining 1,500,000 cubic feet. The election for officers resulted as follows: Directors, Royal C. Taft, William Goddard, A. B. Slater, Jesse Metcalf, G. W. R. Matteson, Lucian Sharpe, Newton D. Arnold, J. Edward Studley and Henry Pearce—the latter succeeds his brother, the late Edward Pearce; President, Royal C. Taft; Vice-President, William Goddard; Treasurer, Secretary and General Manager, A. B. Slater.

MR. OSCAR D. ESTERBROOK, for many years prominent in the directorate of the Brattleboro (Vt.) Gas Light Company, died at his home in Brattleboro, the 7th inst. Deceased was born in West Brattleboro, April 20, 1833, and was a prominent factor in the best business, political and social life of Brattleboro.

THE Philadelphia *Inquirer* says that over 5,000 prepayment meters have been put in use in that city since the U. G. I. Company secured control of its gas supply.

CHICAGO proposes to pass an ordinance that all gas meter inspectors, and other employees of gas companies whose duties oblige them to enter stores, dwellings, etc., shall be garbed in distinctive uniforms.

THE Bellingham Bay Gas Company, Fairhaven, Wash., will make important main extensions this season, and renewals as well. Much gas is being there used for fuel in soldering the cans in which salmon is packed.

AGAIN it is stated that the works of the Penn Yan (N. Y.) Gas Light Company will be rebuilt. The site selected is on Water street, and the understanding is that the new plant will be completed this summer.

THE Directors of the Capital Gas Company, of Sacramento, Cal., have perfected the following executive management: President, J. E. Terry; Vice-President, Oliver Eldridge; Secretary, C. H. Cummings.

AT the annual meeting of the Wilmington (Del.) Coal Gas Company the following Directors were elected: Edward Betts, W. Jones, A. D. Poole, J. Denison, E. T. Bellah, George S. Capelle, Thomas Jackson, Edward Bringhurst, Jr., and Samuel Bancroft, Jr.

NEWS from Tacoma, Wash, is to the effect that Mr. James C. Drake, who has been in charge of the affairs of the Tacoma Gas and Electric Light Company (as Receiver) for the past 17 months, has filed his report. The Court, through Judge Hanford, accepted the Receiver's accounts and ordered his discharge. Our correspondent, in further mention of the matter, says: "When Mr. Drake took charge of the plant, the stock of the Company was worth $10 per share, but owing to the increased business done and to the excellent outlook as well, the shares are quoted at $50. During his guardianship he collected $68,207 and disbursed $57,488, leaving a cash balance of $10,719. The disbursements included the sum of $7,195 for repairs and improvements to plant. Prominent in the betterment schedules are: A new exhauster, new benches, main extensions and roofs to buildings. Judge Hanford, in final settlement of Mr. Drake's accounts, compliments him upon the way in which the trust had been carried out, and allowed him $2,550, compensation over and above the salary drawn during the receivership."

THE Rutherford and Suburban Electric Light and Gas Company, with main offices in East Rutherford, N. J., has been organized. It is capitalized in $200,000. This is likely a branch establishment of the New York, Rutherford and Suburban Gas Company.

CAPTAIN HINDMAN, of the Dewey House, Houston, Tex., speaking recently to a reporter of the Houston *Daily Herald*, said—the subject was lighting by acetylene gas: "Oh, it is a beautiful light; but you could not put one in my house and pay me rent for it. I am talking about acetylene. I had $118 worth of it in about three weeks, and I have had a glorious sufficiency. There is nothing but trouble with it, and it is that kind of trouble that makes a man swear and think of suicide." Capt. Hindman said very much more on the subject, but as the tenor thereof was in a key similar to his introductory remarks, nothing in the way of emphasizing them would be gained by their repetition.

SENATOR EATON, of the Wisconsin Legislature, is responsible for the introduction in that body of a measure which provides for the appointment of a State inspector of gas meters. The Milwaukee *Journal*, in referring to the Eaton proposition, says that, although the bill is ostensibly general in its aim, in reality it will affect only the city of Milwaukee.

So much interest has been manifested in the prize competition inaugurated by the Consumers Gas Company, of Reading, Pa., mention of which has already been made in the JOURNAL, that the Company issued this additional intimation, which explains itself: "The contest inaugurated by the Consumers Gas Company, for the ladies, in which a prize of a gas stove was offered, has proven so popular that the firm has decided to add as a second prize another stove a size smaller. There are at present 11 ladies in the contest, and it grows more interesting daily. Every lady, no matter how often she calls at the office, is entitled to vote for her choice. The contest is open only to ladies residing in Reading, and will close March 31st." The conditions and rules respecting the "contest" will be found in the JOURNAL, February 13th, page 227.

THE authorities of Duluth, Minn., who now control and operate on public account the properties of the taken over Duluth Gas and Water Company, have announced a concession in the selling rates for gas. Under the new schedule, the gross is put at $1.50 per 1,000 cubic feet, with the following discounts for prompt payment—the 10th of the month: 10 cents per 1,000 on the first 2,500 feet; 20 cents per 1,000 on the next 5,000 feet, and 30 cents per 1,000 in excess of the last named. The old rate was $1.75 per 1,000 gross, the same scale of discounts applying.

THE Public Works Commission, of Buffalo, N. Y., in response to their inquiries on the subject, have been informed by the estimators named to determine what would be the cost to erect a plant equal to supplying that city with 2,250,000 cubic feet of gas daily, that an investment of $2,735,000 would be necessary. The named sum, as we understand the report, includes the cost of generating and distributing plant, but not the cost of sites for such plant.

MR. JOHN MCMILLIN, formerly with the old firm of Messrs. Baxter & Lynn, of Detroit, Mich., has been appointed Secretary and Superintendent of the Bellevue (Ohio) Gas Company.

JUDGE MONROE, of the Civil District Court of New Orleans, has decreed that the charter of the Jefferson City Gas Light Company expired the 9th inst. Limitation under the granting act was the basis of the opinion.

THE AMERICAN GAS LIGHT JOURNAL

MONDAY, MARCH 20, 1899.

The Market for Gas Securities.

Things are pretty warm just now in city gas circles, the proprietors of the Standard Gas Light Company having set out to gather in whatever new business may be obtained. Further, they are making quite liberal offers to secure such business, even, it is said, to the point of discounting. The bill to incorporate the Astoria Light, Heat and Power Company passed the Assembly last Wednesday, but as this had been considered for some time a certainty the effect thereof on values was not marked. The extension of the scope of the rate war caused a decrease in quoted values for Consolidated. On the 11th it sold up to 223½, and during the week it was quoted below 214. To-day (Friday) at noon it was 216½. Other city shares show no particular change, but the tone is weak. In suburban New York, Brooklyn Union gas is doing very well, the closing price last night being 159 to 164. It is good for a further rise.

Peoples, of Chicago, shows another marked advance in value, and Bay State, owing to the action of the Boston and New York exchanges in putting it off the call list, is ragged and lower. It is well to remember, though, that the action of the exchanges does not add to or take from the "value" of the shares. The general list is steady.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

March 20.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$39,078,000	100	216	216½
Central Union, Bonds, 5's.	3,000,000	1,000	107½	108½
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	114	.
Metropolitan Bonds	658,000	.	108	112
Mutual	3,500,000	100	316	325
" Bonds	1,500,000	1,000	100	102
Municipal Bonds	750,000	.	..	
New Amsterdam Gas Co.	13,000,000	100	38	38½
Preferred	10,000,000	100	67	68½
Bonds, 5's	11,000,000	1,000	103¾	104
Northern Union, Bonds, 5's.	1,250,000	1,000	94½	95½
New York and East River..				
Bonds 1st 5's	3,500,000	1,000	111	113
" 1st Con. 5's	1,500,000	..	107½	108½
Richmond Co., S. I.	348,650	50	70	..
" Bonds	100,000	1,000	..	..
Standard	5,000,000	100	135	138
Preferred	5,000,000	100	150	155
Bonds, 1st Mortgage, 5's	1,500,000	1,000	112	114
Yonkers	299,65	500	130	..
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	159	164
" " Bonds (5's)	15 000,000	1,000	118	.
Bay State	50,000,000	50	3½	3⅝
" Income Bonds	2,000,000	1,000	..	75
Binghamton Gas Works..	450,000	100	..	..
" 1st Mtg. 5's	450,000	1,000	..	.
Boston United Gas Co.—				
1s Series S. F. Trust	7,000,000	1,000	92	..
2d " " "	3,000,000	1,000	..	80
Buffalo City Gas Co.	5,500,000	100	13¾	14¼
" " Bonds, 5's	5,250,000	1,000	93	93½
Central, San Francisco	2,000,000	..	105	..
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Columbus	1,144,700	100	70	75
1st Mortgage	1,207,000	1,000	101	103½
Consumers. Jersey City	2,000,000	100	88	..
" Bonds	600,000	1,000	104	106
Cincinnati G. & C. Co.	8,500,000	100	209	210
Consumers, Toronto	1,700,000	50	230	235
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	
Consolidated, Baltimore	11,000,000	100	69	69½
Mortgage, 6's	3,600,000	..	107	107½
Chesapeake, 1st 6's.	1,000,000	..	..	..
Equitable, 1st 6's.	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	..
Consolidated Gas Co. of N.J.	1,000,000	100	15	17
" Con. Mtg. 5's	380,000	1,000	80	82
Consolidated G. & E. Co.'s., Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit City Gas Co.	4,560,000	50	65	65½
" Prior Lien 5's	4,546,000	1,000	94¼	94½
Detroit Gas Co., 5's	423,000	1,000	95½	96
" Inc. 5's	31,000	100	..	..
quitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Fort Wayne	2,000,000	..	68	70
" Bonds	2,000,000	..	80	82
Grand Rapids Gas Lt. Co.	1,000,000	50	..	..
" 1st Mtg. 5's	1,125,000	1,000	..	.
Hartford	750,000	25	..	145
Indianapolis	2,000,000	..	100	105
" Bonds, 6's	2 650,000	..	105	106
Jackson Gas Co	250,000	50	..	..
" 1st Mtg. 5's	250,000	1,000	..	..
Jersey City	750,000	20	210	..
Lafayette Gas Co., Ind.	1,000,000	100	68	70
Bonds	1,000,000	1,000	81	86
Louisville	2,570,000	50	106	108
Laclede, St. Louis	7,500,000	100	51	52
Preferred	2,500,000	100	98	100
Bonds	10,000,000	1,000	107½	108
Madison Gas & Elec. Co.	400,000	100	..	..
" 1st Mtg. 6's	350,000	1,000	..	..
Montreal, Canada	2,000,000	100	200	..
Newark, N. J., Gas Co.	1,000,000	..	200	220
Bonds, 6's	4,000,000	..	128	130x
New Haven	1,000,000	25	252	..
Nashville Gas Lt. Co.	1,000,000	50	110	..
Oakland, Cal.	2,000,000	..	53½	55
" Bonds	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	118½	118¾
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	111½	112
2d "	2,500,000	1,000	104	105
Peoples, Jersey City	500,000	50	240	250
Rochester Gas & Elec. Co.	2,150,000	50	52	..
Preferred	2,150,000	50	106	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	10,000,000	100	88½	89
St. Paul Gas Light Co.	1,500,000	100	50	52
1st Mortgage 6's	650,000	1,000	82	85
Extension, 6's	600,000	1,000	..	..
General Mortgage, 5's	2,428,000	1,000	80	82
St. Joseph Gas Co	1,000,000	100	..	..
" 1st Mtg. 5's	750,000	1,000	..	..
Syracuse, N. Y.	1,750,000	100	17	18
Bonds	1,612 000	1,000	85	89
Washington, D. C	2,000,000	20	260	265
First mortgage 6's	600,000	..	..	..
Western, Milwaukee	4,000,000	100	97	97¾
Bonds, 5's	3,880,500	.	106	108
Wilmington, Del.	550,000		208	..

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DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
813 DREXEL BUILDING, PHILA., PA., March 15, 1899.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable on April 18, 1899, to stockholders of record at the close of business March 30. Checks will be mailed.

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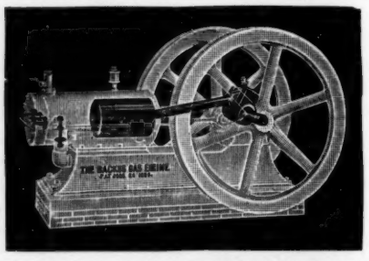

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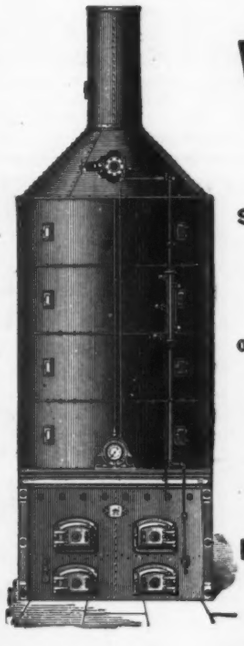

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GAS BROILERS,
GAS HEATING STOVES,
GAS FIRES,
GAS RADIATORS,
GAS LOGS,
GAS CANDY STOVES,
GAS GRIDDLES,
GAS FURNACES,
GAS IRONS,
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AMERICAN BRASS,
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AMERICAN LABOR,

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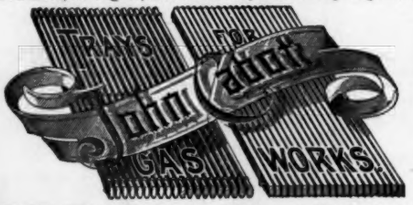

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PRESSURE GAUGE.

For continuous records of Street Gas Pressure. Simple in construction, accurate in operation, and low in price.

Fully Guaranteed. Send for Circulars.

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MANUFACTURERS OF

Valves and Gates for Gas, Ammonia, Water, Etc.

Also, Gate Fire Hydrants with and without Independent Nozzle Valve. All Work Guaranteed.

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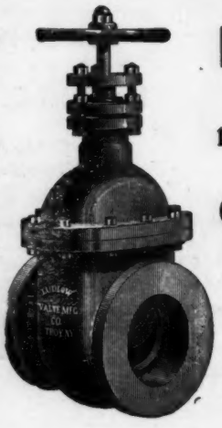

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Double and Single Gate Valves, ¼" to 72",

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Gas, Water, Steam, Oil, Ammonia, Etc.

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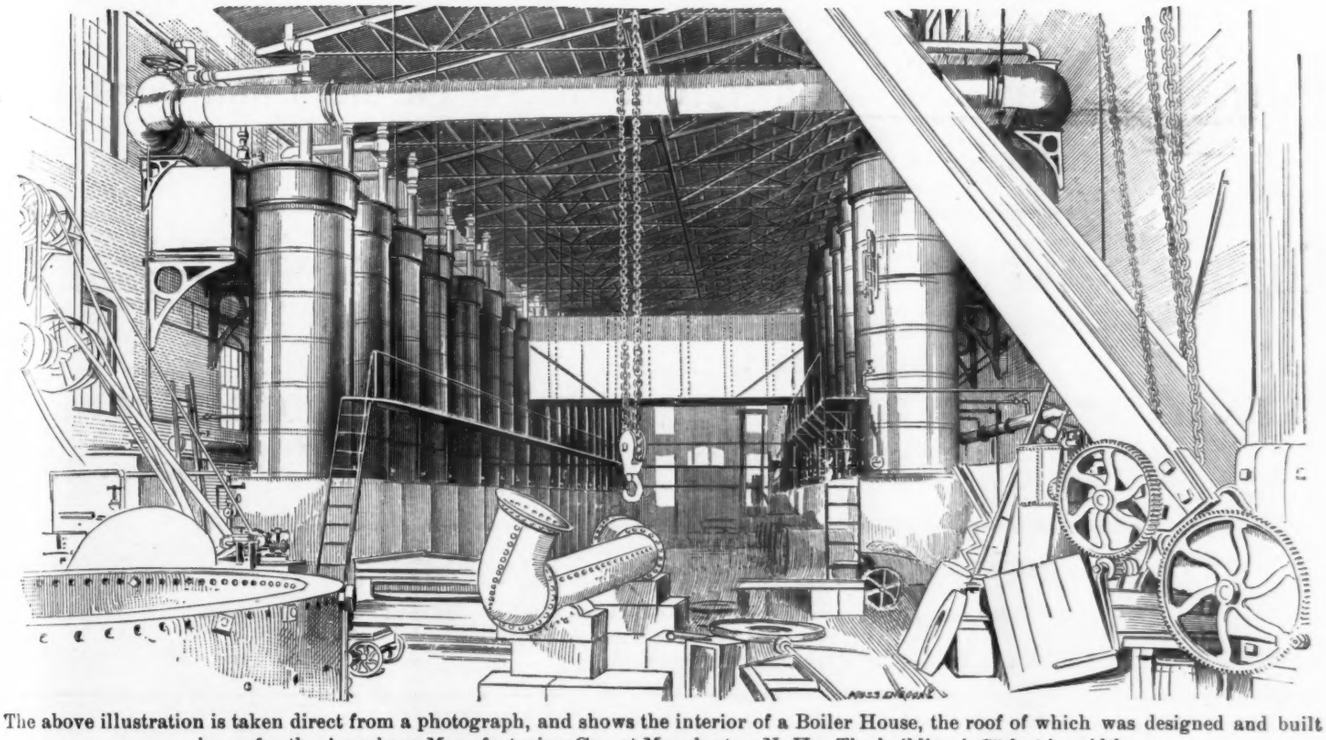

The above illustration is taken direct from a photograph, and shows the interior of a Boiler House, the roof of which was designed and built by us for the Amoskeag Manufacturing Co., at Manchester, N. H. The building is 75 feet in width and 275 feet in length, the entire roof construction being of iron, thus making it absolutely fireproof.

BOSTON OFFICE, 200 Equitable Building.
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Gas Investments in California.

Nowhere else on this continent does such opportunity exist for profitable gas investment as on the Pacific Coast, since the perfection of the new LOWE Process for using the heavy crude California oils (of which there is an unlimited supply) without the use of any other fuels. Seven years' test proves the system to be perfect in every respect. Los Angeles alone, in addition to present street mains, has 150 miles of well built up streets without a gas main on them. To occupy this territory, and a large number of other towns now without gas, we have organized a parent company and a number of local companies covering some of the fastest growing cities in the United States.

Now is the time to invest, when the first capital will be able to double itself in a single year. This is also the most delightful residence section in the United States.

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Constructors of Coal Gas Apparatus.

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Recuperative Furnaces, Washers, Condensers, Purifiers and Purifying Machines, Ammonia Plant, Coke Conveyers, Etc.

Complete Works Erected with Guaranteed Results.

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Gas Enriching Plants to Enrich Coal Gas up to 24 Candle Power, and Making a White, Bright, Non-smoking Gas

GAS RETORTS AND SPECIAL BLOCKS AND FIREBRICK MANUFACTURED UNDER THE SUPERINTENDENCE OF MY OWN CHEMIST.

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LATEST IMPROVED GAS EXHAUSTER

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NEW GAS GOVERNOR AND STEAM VALVE.

GUARANTEED TO REGULATE WITHIN ONE-TENTH OF AN INCH, WATER PRESSURE.

The Most Perfect Gas Governor on the Market.

MORE DIRECT IN ACTION. FEWER PARTS.
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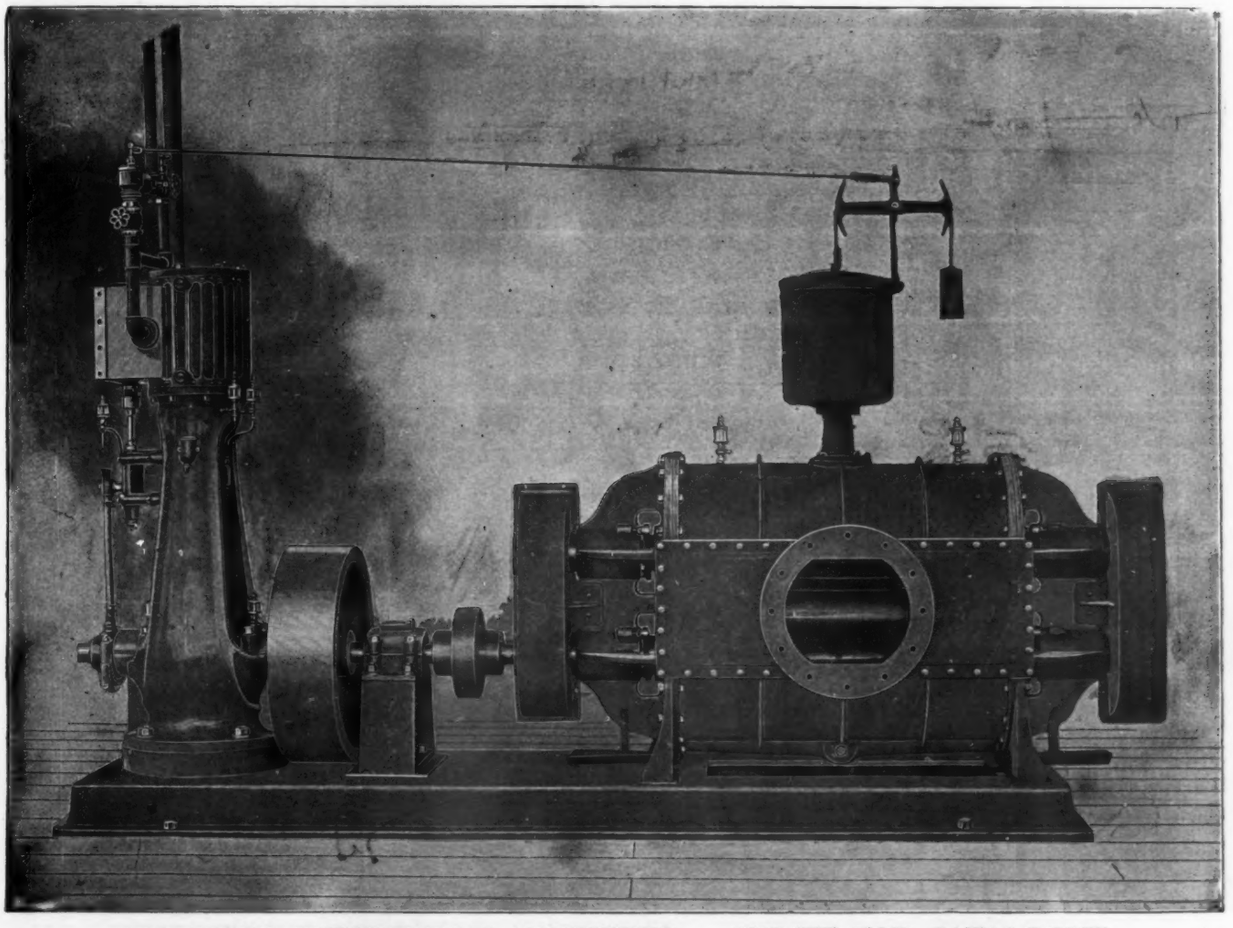

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THE NEW IMPROVED AND PATENTED STREET LIGHT BURNER.

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Our PATENTED "STREET LIGHT APPLIANCES" have made WELSBACH STREET LIGHTING a complete success.

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With Instructions for Care and Working of the Same.

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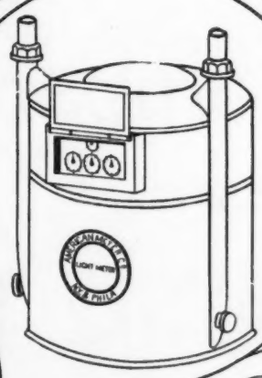

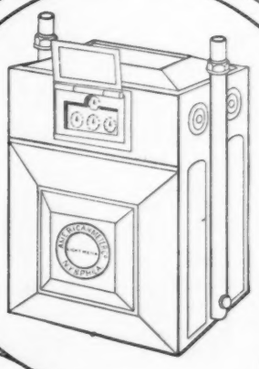

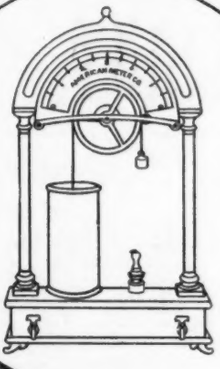

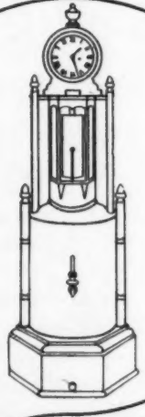

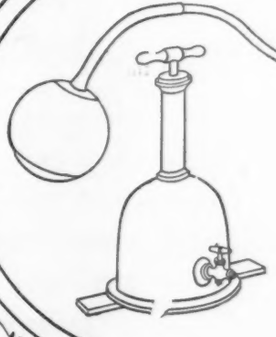

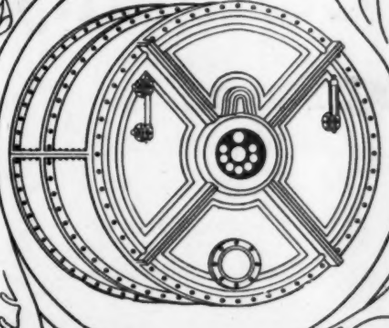

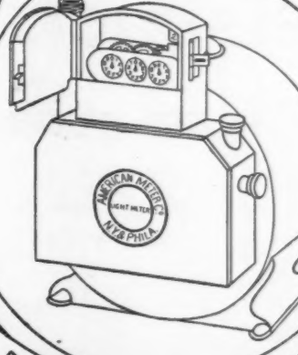

PUBLIC LIGHTING TABLE.

APRIL, 1899.

Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Extinguish.
				P.M.	A.M.
Sat.	1	6.50 PM	1.30 AM	6.10	4.55
Sun.	2	7.00 LQ	2.20	6.15	4.40
Mon.	3	7.00	3.00	6.15	4.40
Tue.	4	7.00	3.40	6.15	4.40
Wed.	5	7.00	4.20	6.15	4.40
Thu.	6	7.00	4.30	6.15	4.40
Fri.	7	7.00	4.30	6.15	4.40
Sat.	8	7.00	4.30	6.15	4.40
Sun.	9	7.00 NM	4.30	6.25	4.30
Mon.	10	7.00	4.30	6.25	4.30
Tue.	11	7.00	4.30	6.25	4.30
Wed.	12	7.00	4.30	6.25	4.30
Thu.	13	7.00	4.30	6.25	4.30
Fri.	14	10.30	4.30	6.25	4.30
Sat.	15	11.20	4.30	6.25	4.30
Sun.	16	11.50	4.20	6.30	4.20
Mon.	17	12.30 AM FQ	4.20	6.30	4.20
Tue.	18	1.00	4.20	6.30	4.20
Wed.	19	1.20	4.20	6.30	4.20
Thu.	20	1.50	4.20	6.30	4.20
Fri.	21	2.10	4.20	6.30	4.20
Sat.	22	2.40	4.20	6.30	4.20
Sun.	23	3.00	4.10	6.40	4.10
Mon.	24	No L.	No L.	6.40	4.10
Tue.	25	No L. FM	No L.	6.40	4.10
Wed.	26	No L.	No L.	6.40	4.10
Thu.	27	7.20 PM	10.20 PM	6 40	4.10
Fri.	28	7.20	11.20	6.40	4.10
Sat.	29	7.20	12.20 AM	6.40	4.10
Sun.	30	7.30	1 00	6.45	4.00

TOTAL HOURS LIGHTING DURING 1899.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	215.40	January	423.20
February	184.40	February	355.25
March	187.40	March	355.35
April	166.50	April	298.50
May	158.00	May	264.50
June	140.50	June	234.25
July	150.30	July	243.45
August	168.30	August	280.25
September	179.50	September	321.15
October	213.20	October	374.30
November	217.00	November	401.40
December	238.10	December	433.45
Total, yr.	2221.00	Total, yr.	3987.45

Welsbach Commercial Company,

DREXEL BUILDING,

PHILADELPHIA.

WE NOW SELL

THE IMPROVED WELSBACH LIGHT

to all gas companies and first-class dealers in gas appliances.

SEND FOR NEW CATALOGUE AND PRICE LIST.

We are now prepared to furnish our New Combination Pilot Jet By-Pass and Adjustable Bunsen.

Our New Hot Wire Electric Igniter is a great improvement in electric gas lighting. Cannot short circuit. Send for prices and full information.

All imitations of the Welsbach light are infringements of the Welsbach patents, and the public is cautioned against purchasing such.

Suits brought by the Welsbach Light Company against manufacturers of infringing lights and mantles are still pending and undetermined.

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Welsbach Commercial Company,

DREXEL BUILDING,

PHILADELPHIA.

Standard Lowe Water Gas Apparatus

Constructed During 1898

BY

THE UNITED GAS IMPROVEMENT COMPANY

Philadelphia.

PLACE.	SETS OF APPARATUS.	DIAMETER OF SHELLS.	
Cleveland, O.	3	8 ft. 6 in.	
Portland, Me.	1	7 ft. 6 in.	
Washington, D. C.	4	8 ft. 6 in.	
Philadelphia, Pa.	20	8 ft. 6 in.	
Norfolk, Va.	1	7 ft. 6 in.	(Second Contract.)
Trenton, N. J.	2	7 ft. 6 in.	
Flint, Mich.	1	4 ft.	
Jenkintown, Pa.	1	5 ft.	
Yonkers, N. Y.	1	8 ft. 6 in.	
Paterson, N. J.	1	8 ft. 6 in.	
Waterbury, Conn.	1	8 ft. 6 in.	
Chicago (Ogden Gas Co.)	1	8 ft. 6 in.	(Second Contract.)
LaFayette, Ind.	1	5 ft.	(Second Contract.)
Lynn, Mass.	1	7 ft. 6 in.	(Second Contract.)
Mt. Clemens, Mich.	1	4 ft.	
New Brunswick, N. J.	1	6 ft.	
Pittsfield, Mass.	1	5 ft.	(Second Contract.)
New York (East River Co.)	2	11 ft.	(Second Contract.)
Johnstown, N. Y.	2	6 ft.	
Waukegan, Ill.	1	5 ft.	
Chester, Pa.	1	6 ft.	(Second Contract.)
Somerville, N. J.	1	4 ft.	
Hackensack, N. J.	1	6 ft.	(Second Contract.)
Torrington, Conn.	2	5 ft.	
Glassport, Pa.	2	5 ft.	

Established 1858. Incorporated 1890.
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In Kegs, 100 to 200 " " 6 " "
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REDUCES LEAKAGE TO MINIMUM, and BENEFITS THE COMPANY and CONSUMER ALIKE!
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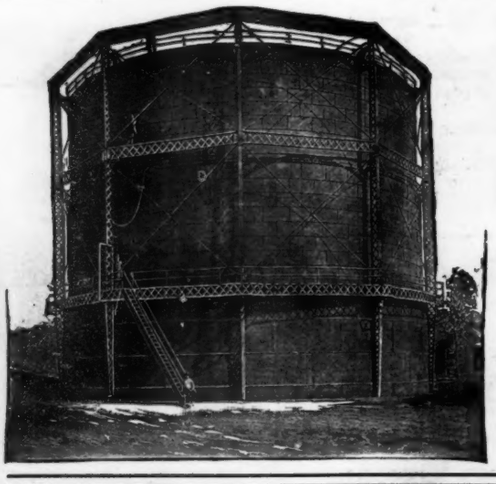

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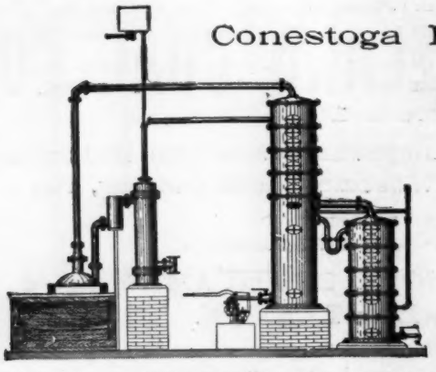

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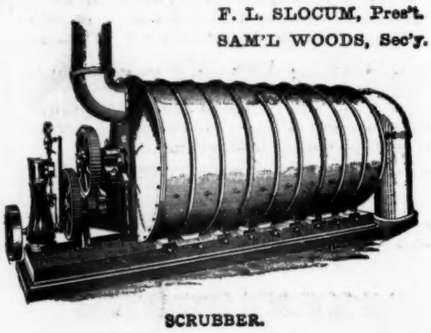

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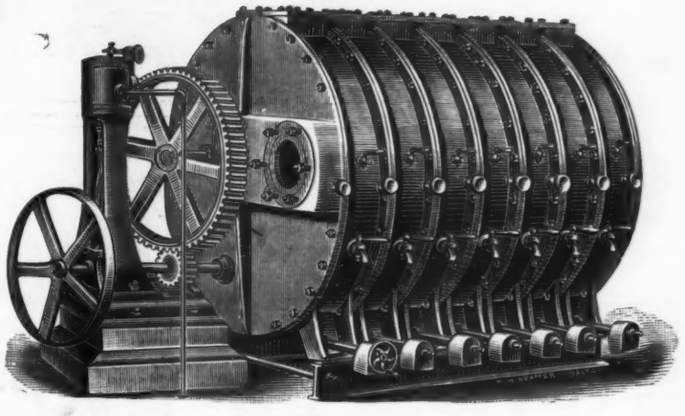

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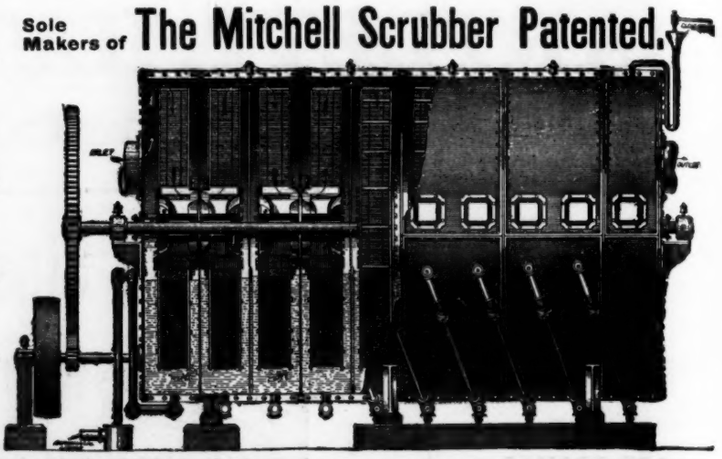

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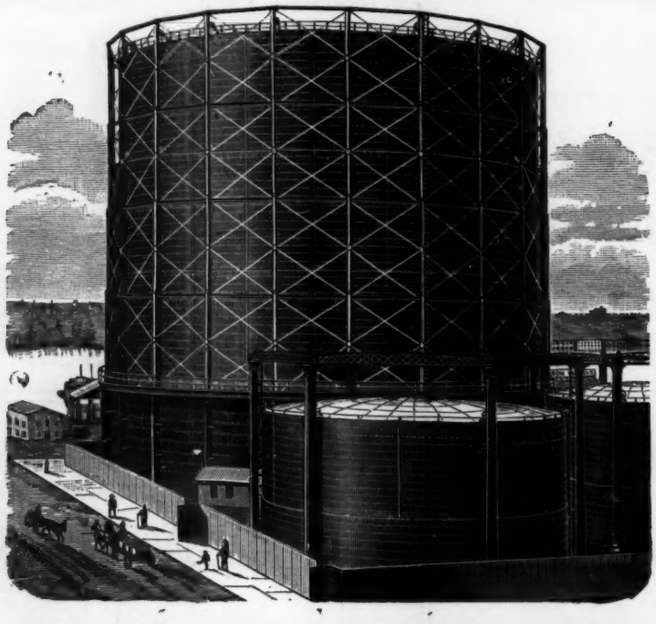

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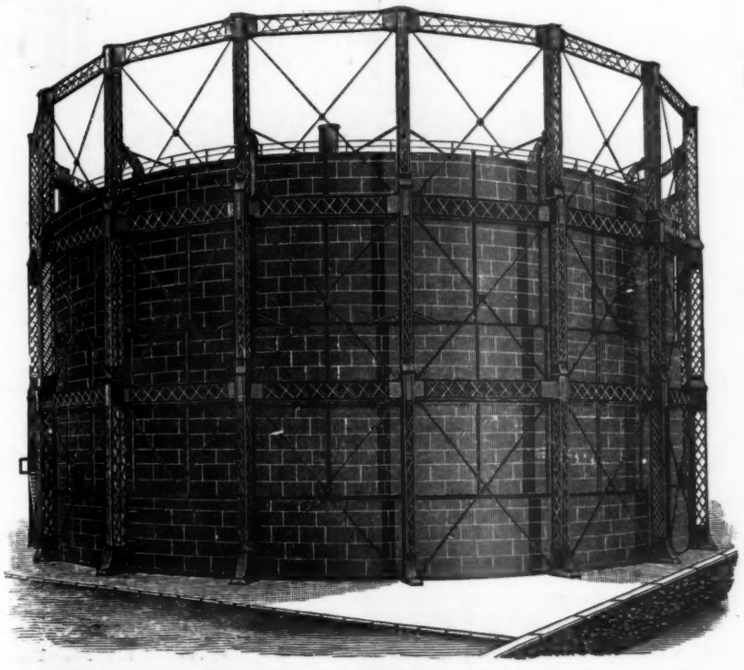

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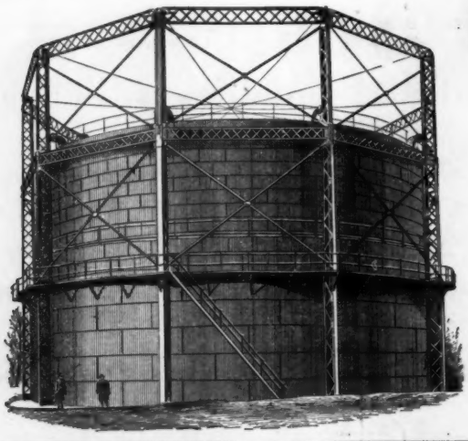

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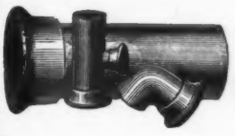

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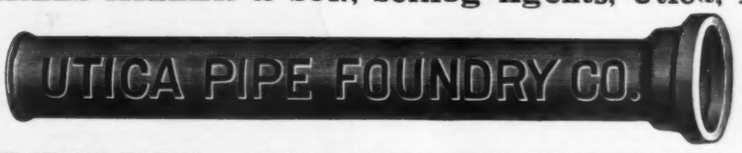

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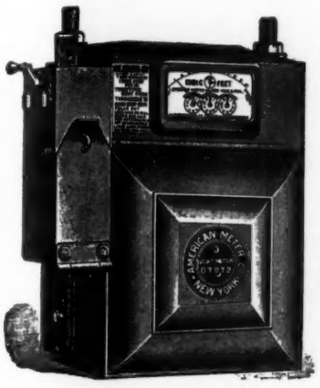

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